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Fireball on 21 April 2026 at 21h01m29s UTC, recorded by the Romanian meteor camera network ROVIMEN, part of the Global Meteor Network. Camera RO000N is installed at Vaslui, eastern Romania.

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Contents

Obituary Enrico Stomeo (1948 – 2026)

Roberto Gorelli

It is very difficult for those who knew Enrico Stomeo well to summarize all the work he carried out in the field of meteoritics. I met Enrico Stomeo in January 1983 through postal mail; at that time, the Internet and email did not yet exist, things that were still science fiction back then. Shortly thereafter, I met him in person at the Lido di Venezia, where he lived at the time. I was beginning to seriously devote myself to the study of meteors and found in Enrico a person who was extremely knowledgeable on the subject; he introduced me to meteoritics, the branch of astronomy that deals with all phenomena related to meteor phenomena, at that time only on Earth, but today also on other planets in the solar system.

Enrico was an architect, an employee of the City of Venice whose job was to combat illegal construction in a city as delicate as a Murano glass. Despite lacking a degree in a scientific field, Enrico acquired professional-level knowledge of meteoritics: this knowledge was channeled into both actual research and public outreach.

Enrico is particularly remembered for having led the Meteor Section of the UAI (Italian Amateur Astronomers Union) for over forty years, as well as for having conducted visual and photographic observations during that same period, and for having created, in June 1980, the newsletters of the UAI Meteor Section. The newsletters contained observations from the Section's observers, reports of fireballs, and news drawn from all kinds of Italian sources, but especially from abroad, broadening the horizons of Italian observers and allowing each observer's observations to take on true scientific significance by linking together like a giant puzzle in which the aggregated data formed the pattern of all the meteor showers throughout the year.

He was highly active in representing the Section, participating in numerous national and international conferences and meetings such as the IMC (International Meteor Congress) in Frasso Sabino (Italy, September 23–26 September 1999), Cerkno (Slovenia, 20–23 September 2001), Porec, Croatia (2009), Poznan, Poland (2013), Mistelbach, Austria (2015) and the meeting of Italian meteor observers on 2 July 2005 in Pruno (Stazzema, LU).

In the field of outreach, Enrico's activities expanded in many directions, the main one being to raise awareness of the Meteor Section of the UAI (Italian Amateur Astronomers Union) in Italy and abroad, establishing contacts with all those interested in this field, holding lectures and courses at the University of the Third Age in Venice's historic center, and participating in numerous annual conferences of the UAI.

On the international stage, Enrico began forging ties with amateur astronomers and professional astronomers as early as the 1970s: this desire for collaboration was also developing independently among amateur astronomers in other countries and led first to the founding of FEMA (Federation of European Meteor Astronomers), and then, after its dissolution, to the founding of the IMO (International Meteor Organization) under the leadership of Paul Roggemans. I must say that at the time I did not fully grasp the scientific potential of this movement born of a spontaneous convergence: as has often happened in the past, when an idea is ripe, its blossoming is merely a matter of time, opportunity, and the right people.

Enrico Stomeo and his wife Marina Bolis at the International Meteor Conference at Porec, Croatia in 2009.

Damir Segon (left) and Enrico Stomeo (right) at the International Meteor Conference at Poznan, Poland in 2013.

Enrico Stomeo during a break at the International Meteor Conference at Mistelbach, Austria in 2015.

Enrico Stomeo during the last night of the International Meteor Conference at Mistelbach, Austria in 2015.

On a more conventional level, Enrico wrote countless articles, participated in the construction of the Venice Planetarium, attended numerous congresses and conferences, and took part in several missions to observe meteors or field searches for meteorites.

In recent years, he was awarded two honors: the Ruggieri Prize in 2024 and the Martino Nicolini Prize in 2026.

I hadn't heard from him in a few years, though I had been following his work; in recent times, while he continued his work, he was a bit less active. Now many of us know why: his health and perhaps even his age were taking their toll, and one day in mid-May I received the unexpected news of his passing away. It wasn't confirmed at first, but unfortunately, confirmation came in the days that followed. Enrico got 78 years old in April.

I have lost a friend, and Italian astronomy—and not just Italian astronomy—has lost a great amateur astronomer.

Zeta-Pavonids (ZPA#853) confirmed

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A short duration meteor activity lasting about 24 hours has been detected by GMN on 21st – 22nd March 2026 from a radiant at R.A. 279.8° and decl. –70.6° with a geocentric velocity of 55.7 km/s. The activity has been identified as the zeta-Pavonids (ZPA#853), a long-period comet type meteor stream. This case study confirms the existence of this annual meteor shower that fulfils the criteria in order to be nominated for established status by the IAU-MDC.

1 Introduction

The radiant density map for the 21st and 22nd March 2026 showed a bright spot caused by a short duration meteor shower (*Figure 1*). The activity lasted about 24 hours and no trace was recorded the day before or the day after this event. The shower was not listed in the GMN meteor shower reference list but is identified as the zeta-Pavonids (ZPA#853)[1] in the IAU-MDC Working List of Meteor Showers. The shower was detected from a group of five triangulated meteors by CAMS in 2016 (Jenniskens et al., 2018). More zeta-Pavonids were observed in 2020 and 2021 with an unusually short duration (Jenniskens, 2021; 2023).

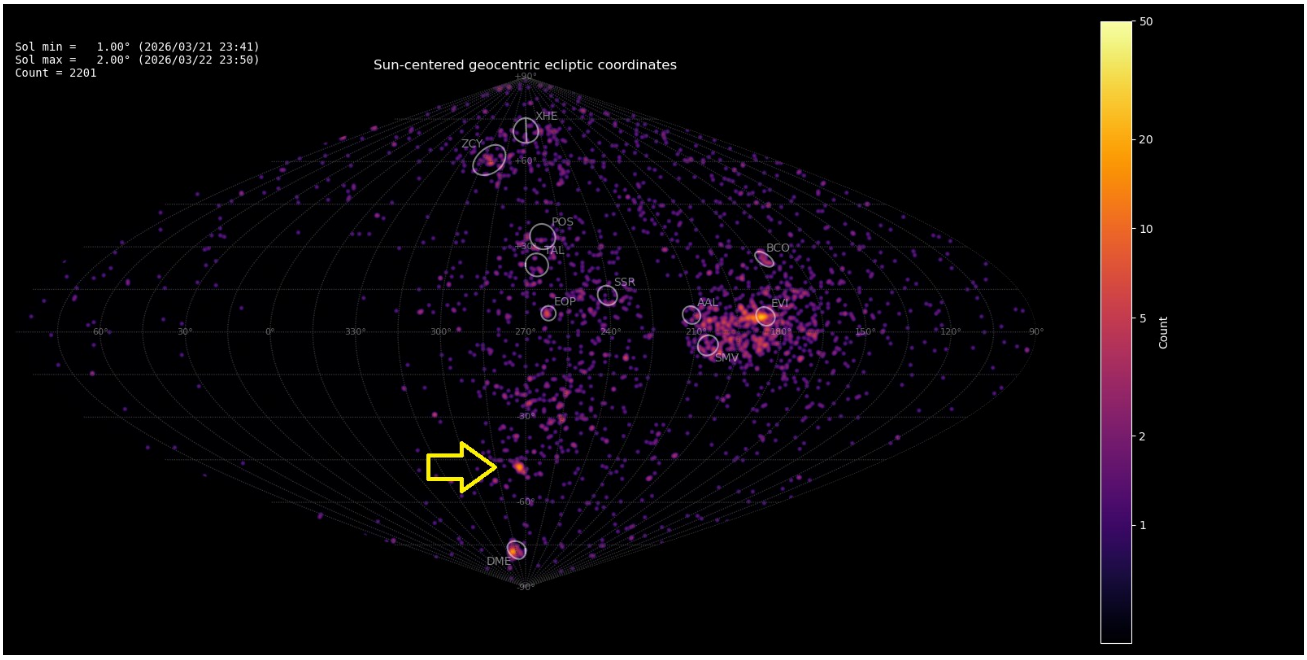

Figure 1 – Radiant density map with 2201 radiants obtained by the Global Meteor Network during the 21st – 22nd March, 2026. The position of the zeta-Pavonids in Sun-centered geocentric ecliptic coordinates is marked with a yellow arrow.

[1] https://www.ta3.sk/IAUC22DB/MDC2022/Roje/pojedynczy_obiekt.php?lporz=02141&kodstrumienia=00853

2 2026 zeta-Pavonids

The GMN shower association criteria assume that meteors within 1° in solar longitude, within 1.6° in radiant in this case (*Figure 2*), and within 10% in geocentric velocity of a shower reference location are members of that shower. Further details about the shower association are explained in Moorhead et al. (2020). Using these meteor shower selection criteria, 36 orbits have been identified as zeta-Pavonids recorded in 2026 by 88 GMN cameras installed in Australia, New Zealand and South Africa, with the cameras listed at the end of this document. The final results have been listed in *Table 2*. The radiant size appears to be very compact in equatorial (*Figure 3*) and in ecliptic coordinates (*Figure 5*). The radiant drift is uncertain due to the short activity interval (*Figure 4*).

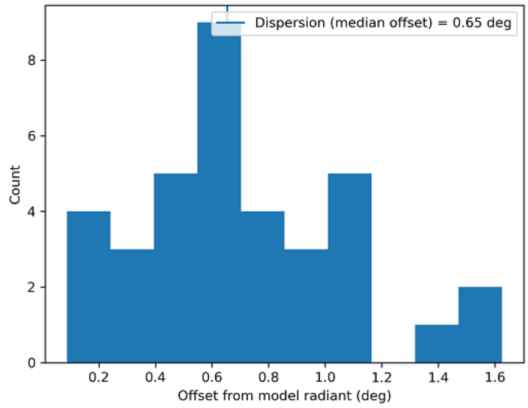

Figure 2 – Dispersion median offset on the radiant position.

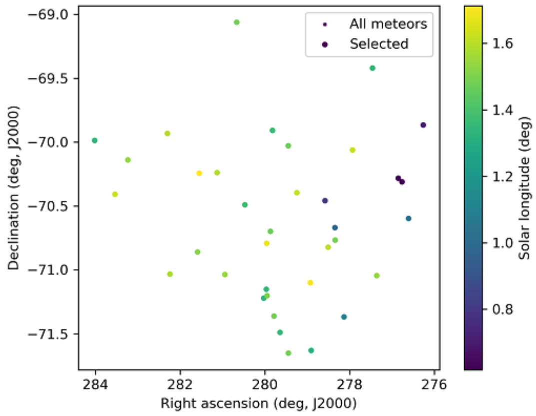

Figure 3 – The radiant distribution during the solar-longitude interval 0.62° – 1.71° in equatorial coordinates.

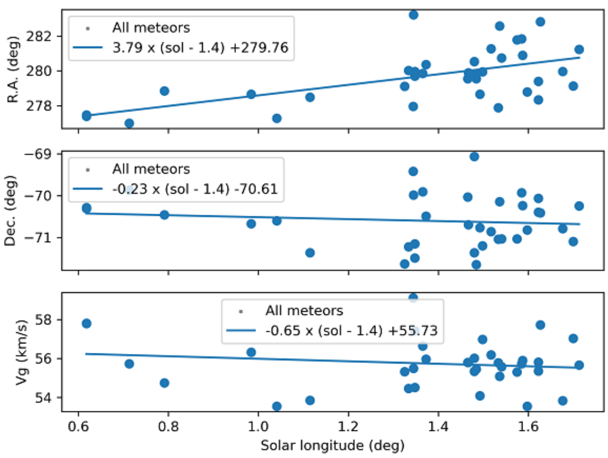

Figure 4 – The radiant drift.

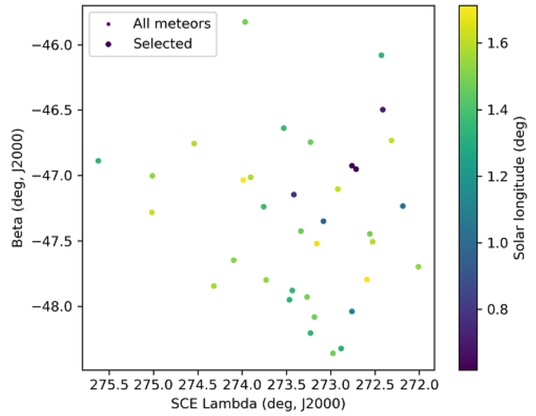

Figure 5 – The radiant distribution during the solar-longitude interval 0.62° – 1.71° in Sun centered geocentric ecliptic coordinates.

3 Shower classification based on orbits

A complete independent meteoroid stream search has been applied to orbit data obtained between Solar Longitude 0° and 2° during the years 2019 to 2026. The method has been described in detail in a separate publication (Roggemans et al., 2026a). 15463 orbits were available within this time interval and a final mean orbit has been computed by the method of Jopek et al. (2006) for the thresholds according to the Rayleigh fit in *Figure 6*, with as cutoff value $D_{SH} < 0.125$ and $D_D < 0.05$ and $D_J < 0.125$ (Southworth and Hawkins, 1963; Drummond, 1981; Jopek, 1993). The results and mean orbit based upon 90 meteors for 2022–2026 are listed in *Table 2*.

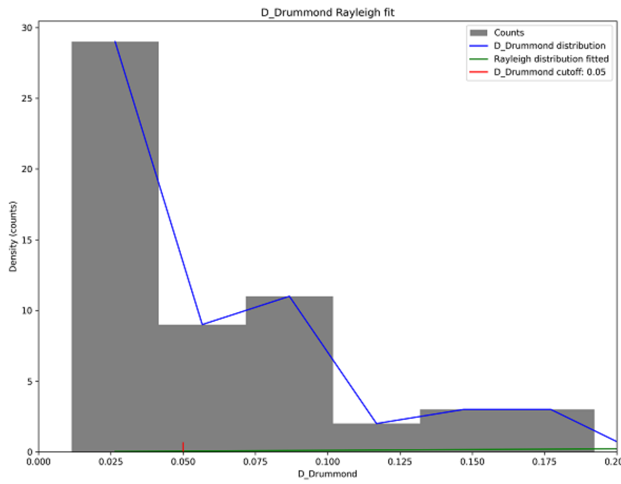

Figure 6 – Rayleigh fit on the Drummond criterion for zeta-Pavonids, 2026 data results in a cutoff value od $D_D = 0.05$.

The radiant is very compact in geocentric equatorial coordinates (*Figure 7*). The spread in Right Ascension is due to the proximity of the Southern Pole. The compactness of the radiant becomes clearer in the geocentric Sun-centered ecliptic coordinates (*Figure 8*). Meteors associated with the zeta-Pavonids with more tolerant D-criteria of $D_{SH} < 0.2$ and $D_D < 0.08$ and $D_J < 0.2$, do not deviate much from the main radiant and are most likely outliers of the same meteor shower. The number of zeta-Pavonid meteors as a percentage relative to the total number of meteors recorded at the Southern hemisphere results in the profile plotted in *Figure 9*. Best rates occurred at $\lambda_{\odot} = 1.3 \pm 0.1°$ and the total activity duration took about 24 hours.

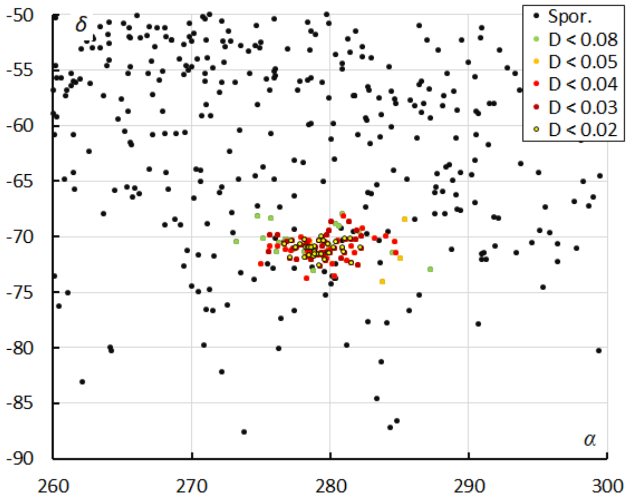

Figure 7 – The radiant distribution during the solar-longitude interval 0° – 2° in equatorial coordinates, color-coded for different threshold values of the combined similarity criteria.

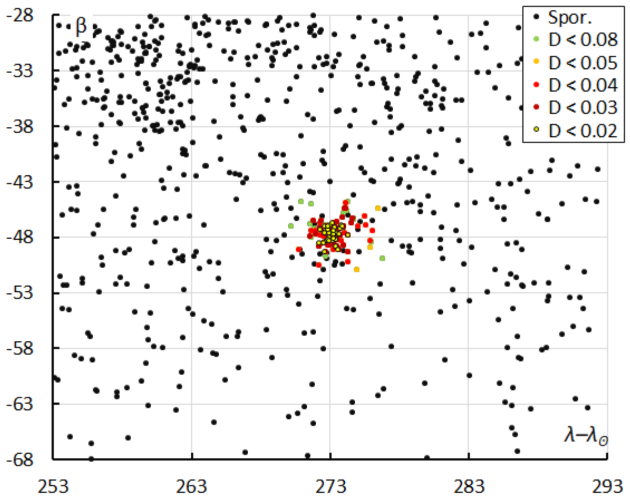

Figure 8 – The radiant distribution during the solar-longitude interval 0° – 2° in Sun-centered geocentric ecliptic coordinates, color-coded for different threshold values of the combined similarity criteria.

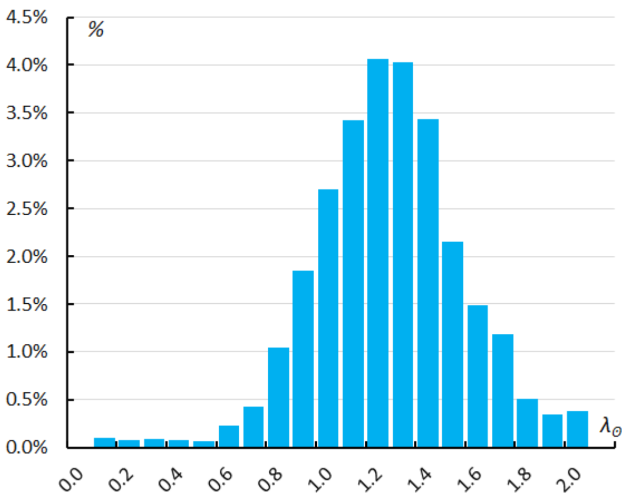

Figure 9 – The percentage of zeta-Pavonids relative to the total number of meteors, for the orbit classification method 2022–2026.

Table 1 – Number of zeta-Pavonid orbits detected by GMN per year.

Year	Radiant method
2022	3
2023	8
2024	28
2025	22
2026	29

The number of zeta-Pavonids identified per year reflects the expansion of GMN at the Southern hemisphere (*Table 1*). The shower displays annual activity and there is no indication for any periodicity or outbursts.

4 Orbit and parent body

The diagram of the inclination *i* versus the Longitude of Perihelion *Π* shows a clear concentration (*Figure 10*). The eccentricity *e* versus the Longitude of Perihelion *Π* appears scattered in *e* due to the large uncertainties in *e* (*Figure 11*).

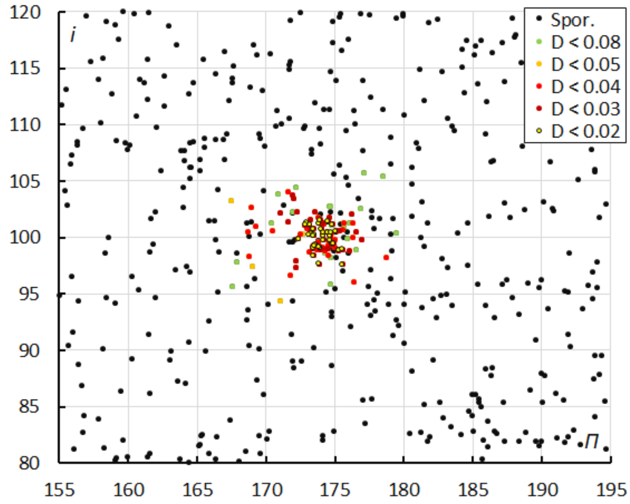

Figure 10 – Inclination *i* versus the Longitude of Perihelion *Π* color-coded for different classes of D-criteria thresholds, for $\lambda_{\odot}$ between 0° and 2°. Spor. = sporadics.

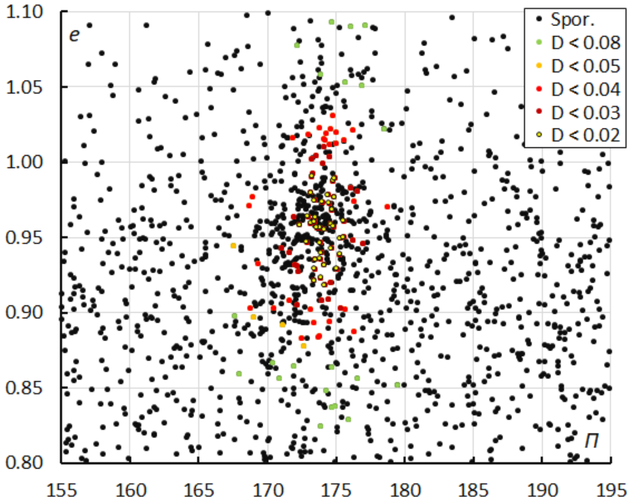

Figure 11 – Eccentricity *e* versus the Longitude of Perihelion *Π* color-coded for different classes of D-criteria thresholds, for $\lambda_{\odot}$ between 0° and 2°. Spor. = sporadics.

There is another concentration in the e versus Π diagram intermixed with the zeta-Pavonids. These orbits correspond to the delta-Mensids (DME#0130), an unconfirmed meteor shower associated with comet C/1804 E1 (Pons)[2]. The delta-Mensids have the same eccentricity and the same longitude of perihelion as the zeta-Pavonids.

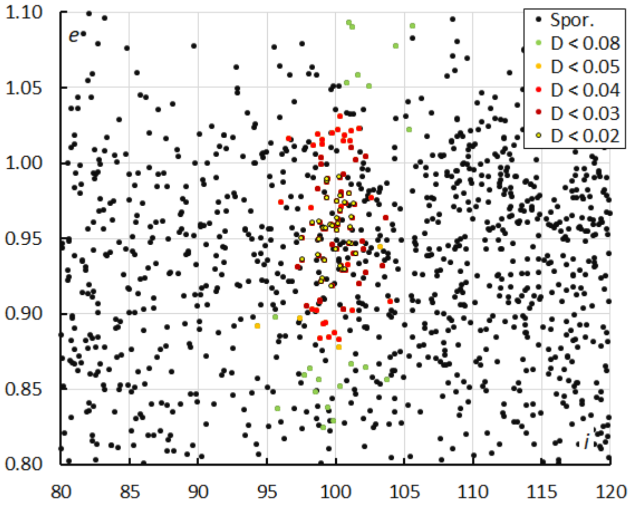

Figure 12 – Eccentricity e versus the inclination i color-coded for different classes of D-criteria thresholds, for $\lambda_\odot$ between 0° and 2°. Spor. = sporadics.

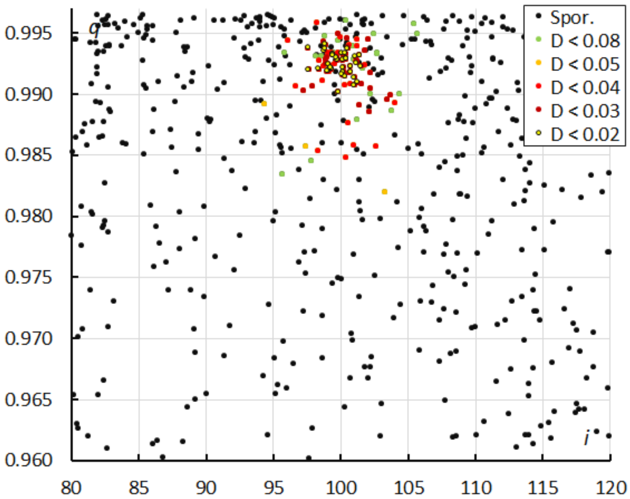

Figure 13 – Perihelion distance q versus the inclination i color-coded for different classes of D-criteria thresholds, for $\lambda_\odot$ between 0° and 2°. Spor. = sporadics.

Looking at the diagram eccentricity e versus inclination i, we see the same spread in eccentricity due to the large uncertainty near the parabolic limit of $e = 1$ (*Figure 12*). The zeta-Pavonid orbits show a clear concentration in perihelion distance q versus inclination i (*Figure 13*).

The Tisserand value relative to Jupiter with $T_J = 0.03$ is typical for a long-period cometary orbit (*Figure 14*). The meteoroid stream crosses the ecliptic and Earth's orbit on a retrograde orbit ($i > 90°$) at its ascending node (*Figure 15*). The descending node is situated far beyond the orbit of Neptune. A search for parent bodies did not reveal any good match based upon the Drummond D-criterion. Note that also the parent body of the delta-Mensids, C/1804 E1 (Pons), appears in the list (*Table 3*).

Table 2 – Comparing solutions obtained by the radiant method for 2026, the orbit method 2022–2026 for $D_D < 0.05$, compared to the solution by Jenniskens (2023).

	Radiant 2026	Orbit method $D_D < 0.05$	Jenniskens (2023)
$\lambda_\odot$ (°)	1.48	1.20	1.4
$\lambda_{\odot b}$ (°)	0.61	0.21	1.0
$\lambda_{\odot e}$ (°)	1.71	1.84	2.0
α_g (°)	279.8	279.4	279.5
δ_g (°)	–70.6	–71.0	–71.1
$\Delta\alpha_g$ (°)	+3.79	+2.72	+1.27
$\Delta\delta_g$ (°)	–0.23	+0.54	+0.11
v_g (km/s)	55.7	55.4	56.3
H_b (km)	112.5	112.1	113.4
H_e (km)	100.2	99.5	99.4
H_p (km)	105.1	104.2	104.7
Mag_{Ap}	–1.1	–1.3	+0.71
λ_g (°)	274.8	274.5	274.3
$\lambda_g - \lambda_\odot$ (°)	273.3	273.3	272.9
β_g (°)	–47.3	–47.7	–48.1
a (A.U.)	28.7	21.6	999
q (A.U.)	0.991	0.991	0.993
e	0.965	0.954	1.0
i (°)	100.8	100.0	99.6
ω (°)	352.52	352.48	353.6
Ω (°)	181.38	181.25	181.4
Π (°)	173.9	173.7	174.8
T_j	–0.05	0.03	–0.21
N	36	90	45

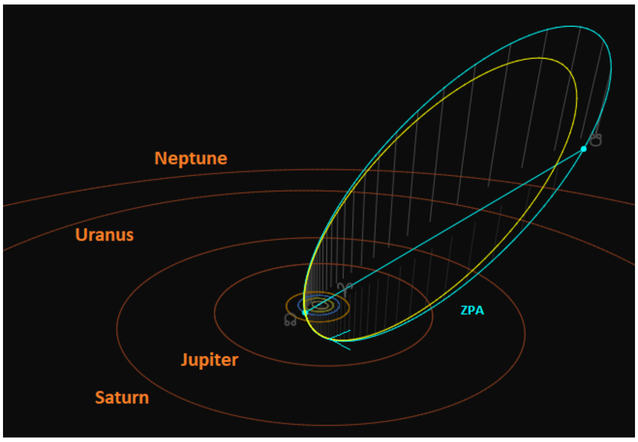

Figure 14 – Comparing the radiant determined zeta-Pavonids solution for 2026 (blue) with the orbit determined solution for 2022–2026 (yellow). (Plotted with the Orbit visualization app provided by Pető Zsolt).

[2] https://www.ta3.sk/IAUC22DB/MDC2022/Roje/pojedynczy_obiekt.php?lporz=00452&kodstrumienia=00130

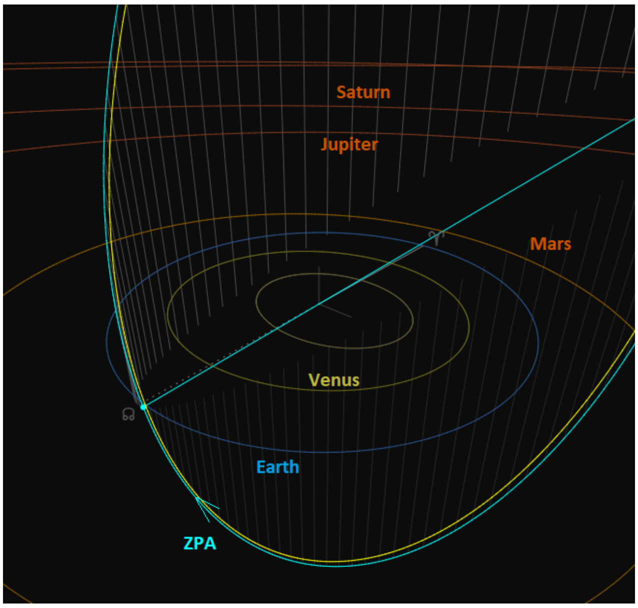

Figure 15 – Comparing the radiant determined zeta-Pavonids solution for 2026 (blue) with the orbit determined solution 2022–2026 (yellow), close-up at the inner Solar System. (Plotted with the Orbit visualization app provided by Pető Zsolt).

Table 3– Top ten matches of a search for possible parent bodies with $D_D < 0.3$, based upon the mean orbit derived from the radiant classification method.

Name	D_D
C/1999 T1 (McNaught-Hartley)	0.151
C/1907 G1 (Grigg-Mellish)	0.174
C/1893 U1 (Brooks)	0.192
C/1742 C1	0.219
C/2001 Q4 (NEAT)	0.223
C/1894 G1 (Gale)	0.254
(466130) 2012 FZ23	0.268
C/1930 D1 (Peltier-Schwassmann-Wachmann)	0.274
C/2016 E2 (Kowalski)	0.284
C/1804 E1 (Pons)	0.284

5 Conclusion

This GMN meteoroid orbit data case study confirms the existence of the zeta-Pavonids. The GMN results are in very good agreement with the earlier reported parameters obtained by CAMS (Jenniskens, 2023). Our independent solution has been reported to the IAU-MDC, and the shower now fulfils the criteria for being upgraded to be nominated for established status.

6 Acknowledgment

This report is based on the data of the Global Meteor Network (Vida et al., 2020a; 2020b; 2021) which is released under the CC BY 4.0 license[3]. We thank all 927 participants in the Global Meteor Network project for their contribution and perseverance. A list with the names of the volunteers who contribute to GMN has been published in the 2025 annual report (Roggemans et al., 2026b). The following 181 cameras contributed to paired meteors used in this study: AU0001, AU0002, AU0003, AU0004, AU0006, AU0007, AU0009, AU000A, AU000B, AU000D, AU000E, AU000F, AU000G, AU000R, AU000S, AU000U, AU000V, AU000X, AU000Y, AU0010, AU001A, AU001B, AU001C, AU001D, AU001E, AU001F, AU001L, AU001N, AU001P, AU001S, AU001U, AU001V, AU001W, AU001X, AU0028, AU002B, AU002E, AU002F, AU0030, AU0035, AU0036, AU0038, AU003J, AU0042, AU0044, AU0048, BR000F, BR000Q, NZ0001, NZ0002, NZ0004, NZ0008, NZ000A, NZ000D, NZ000G, NZ000H, NZ000M, NZ000N, NZ000Q, NZ000R, NZ000S, NZ000V, NZ000W, NZ000X, NZ000Y, NZ000Z, NZ0010, NZ0011, NZ0012, NZ0015, NZ0016, NZ0017, NZ0018, NZ001A, NZ001C, NZ001E, NZ001G, NZ001H, NZ001J, NZ001L, NZ001N, NZ001P, NZ001Q, NZ001R, NZ001S, NZ001V, NZ001W, NZ001X, NZ001Y, NZ0020, NZ0022, NZ0024, NZ0025, NZ0026, NZ0027, NZ0029, NZ002C, NZ002D, NZ002F, NZ002H, NZ002J, NZ002K, NZ002L, NZ002N, NZ002P, NZ002Q, NZ002R, NZ002S, NZ002V, NZ002W, NZ002X, NZ002Y, NZ002Z, NZ0030, NZ0032, NZ0033, NZ0034, NZ0035, NZ0036, NZ0037, NZ0038, NZ003A, NZ003C, NZ003E, NZ003G, NZ003H, NZ003N, NZ003Q, NZ003R, NZ003S, NZ003V, NZ003W, NZ003X, NZ003Y, NZ003Z, NZ0041, NZ0042, NZ0045, NZ0046, NZ0049, NZ004A, NZ004B, NZ004C, NZ004E, NZ004H, NZ004J, NZ004L, NZ004M, NZ004N, NZ004S, NZ004U, NZ004W, NZ004X, NZ004Y, NZ004Z, NZ0051, NZ0059, NZ005G, NZ005J, NZ005K, NZ005L, NZ005M, NZ005Q, NZ005R, NZ005S, NZ005T, NZ005U, NZ006J, NZ006M, NZ006N, NZ006P, NZ006Q, NZ007B, NZ007E, NZ007F, ZA0001, ZA0002, ZA0007, ZA000A, ZA000C and ZA000D.

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[3] https://creativecommons.org/licenses/by/4.0/

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Spectrum of a minus one magnitude meteor from the northern branch of Librids-Lupids on May 19, 2026

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On May 19, 2026, the SonotaCo Network in Japan recorded a meteor from the northern branch of Librids-Lupids with a radiant position at $\alpha = 224.4°$ and $\delta = –9.3°$ with a geocentric velocity $v_g = 13.4$ km/s (equinox J2000). The parent body is 2020KP and the spectrum of the meteor shows dominance of iron.

1 Observations

The SonotaCo Network in Japan has recorded the spectrum of a –1 magnitude meteor of the Northern Librids-Lupids[4] (NLL#422)[5].

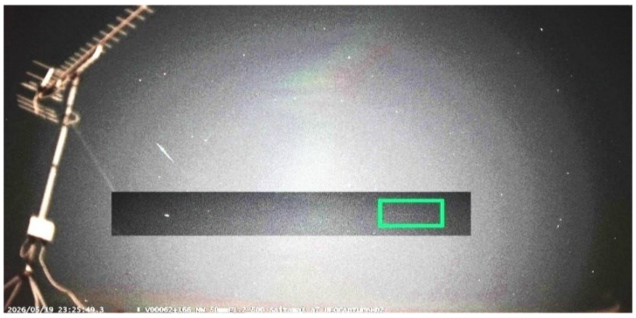

Figure 1 – Spectrum of a –1 magnitude meteor of the Northern Librids-Lupids.

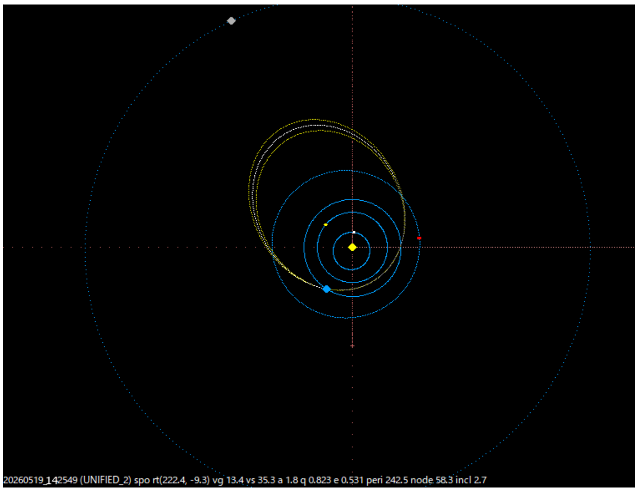

Figure 2 – Orbit of the Northern Librids-Lupids.

The 2026 meteor shows an almost identical orbit to 2020 KP and the NLL mean orbit. The Drummond D-criterion is as low as $D_D = 0.0008–0.0029$, and the Southworth–Hawkins criterion is $D_{SH} = 0.03–0.08$, indicating that the meteor is dynamically indistinguishable from the NLL filament associated with 2020 KP, even though its radiant lies close to the antihelion source (*Figure 3*).

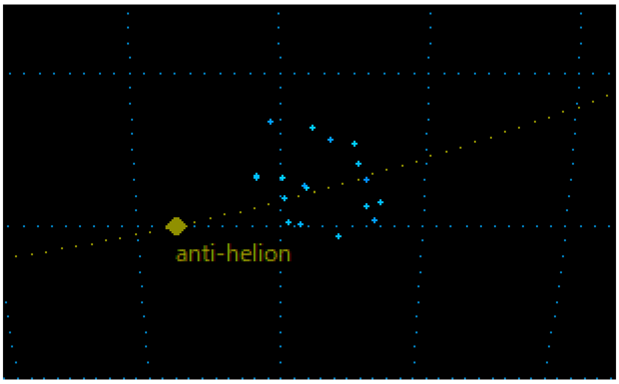

Figure 3 – Simultaneous observation radiant points of the Northern Librids-Lupids during the years 2007–2026 by the SonotaCo Network in Japan.

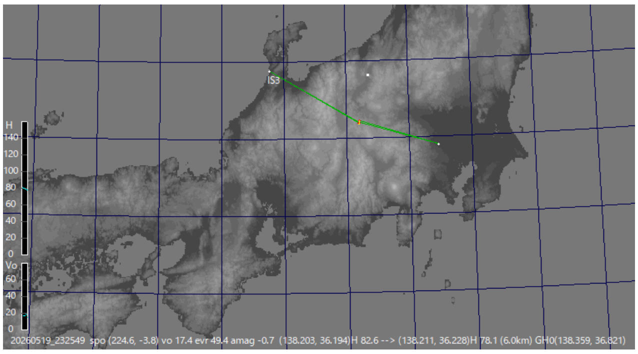

Figure 4 – Trajectory groundmap.

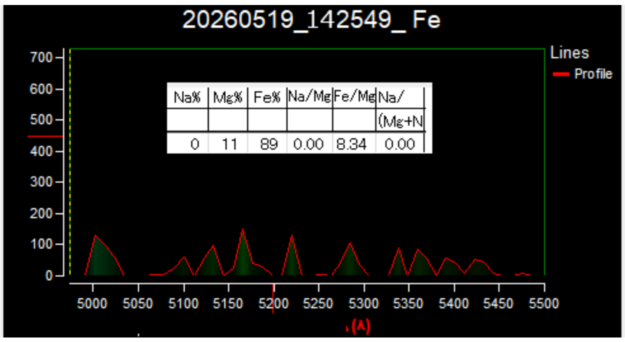

Figure 5 – Result of the spectrum analysis.

[4] https://sonotaco.jp/forum/viewtopic.php?t=6190
[5] https://www.ta3.sk/IAUC22DB/MDC2022/Roje/pojedynczy_obiekt.php?lporz=01193&kodstrumienia=00422&colecimy=4&kodmin=00001&kodmax=01239&lpmin=00003&lpmax=02614&sortowanie=0

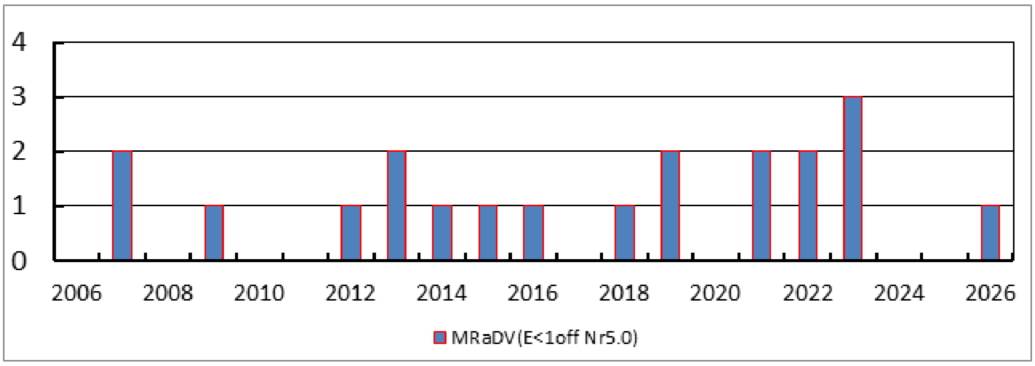

Figure 6 – Number of Northern Librids-Lupids per year by the SonotaCo Network Japan.

Table 1 – Comparing the orbits between parent body and meteoroid stream.

Name	*a*	*e*	*q*	*i*	*ω*	*Ω*	D_{SH}	D_D	T_J	$λ_Π$	$β_Π$	*α*	*δ*	v_g
Center														
Meteor	1.75	0.531	0.823	2.7	242.5	58.3	0	0	3.95	300.8	-2.4	222.4	-9.3	13.4
2020KP	1.84	0.54	0.844	3.6	238.8	61.0	0.03	0	3.83	299.8	-3.1	222.2	-7.0	13.6
NLL_ia	1.85	0.548	0.834	0.2	239.9	67.9	0.08	0	3.81	307.8	-0.2	227.9	-17.4	13.3
Northern														
JEO_ib	2.53	0.659	0.866	4.9	230.3	89.1	0.24	0.05	3.09	319.3	-3.8	244.7	-8.8	14.9
COR_ib	2.35	0.571	0.999	2.6	193.7	91.8	0.23	0.02	3.33	285.5	-0.6	205.8	0.2	8.7
Catalina	2.69	0.694	0.825	5.7	222.7	95.9	0.26	0.08	2.96	318.4	-3.9	232.2	-11.3	19.8
Southern														
SSC_ia	2.85	0.757	0.693	1.7	74.7	250.0	0.27	0.12	2.79	324.7	1.6	243.7	-22.1	23
HVI_ic	2.28	0.659	0.742	0.9	72.7	218.2	0.19	0.04	3.36	290.9	0.9	204.8	-11.5	17.2
Wilson-Harrington	2.63	0.632	0.967	2.8	95.4	266.8	0.2	0.06	3.08	2.2	2.8	252.2	-25.3	20.4

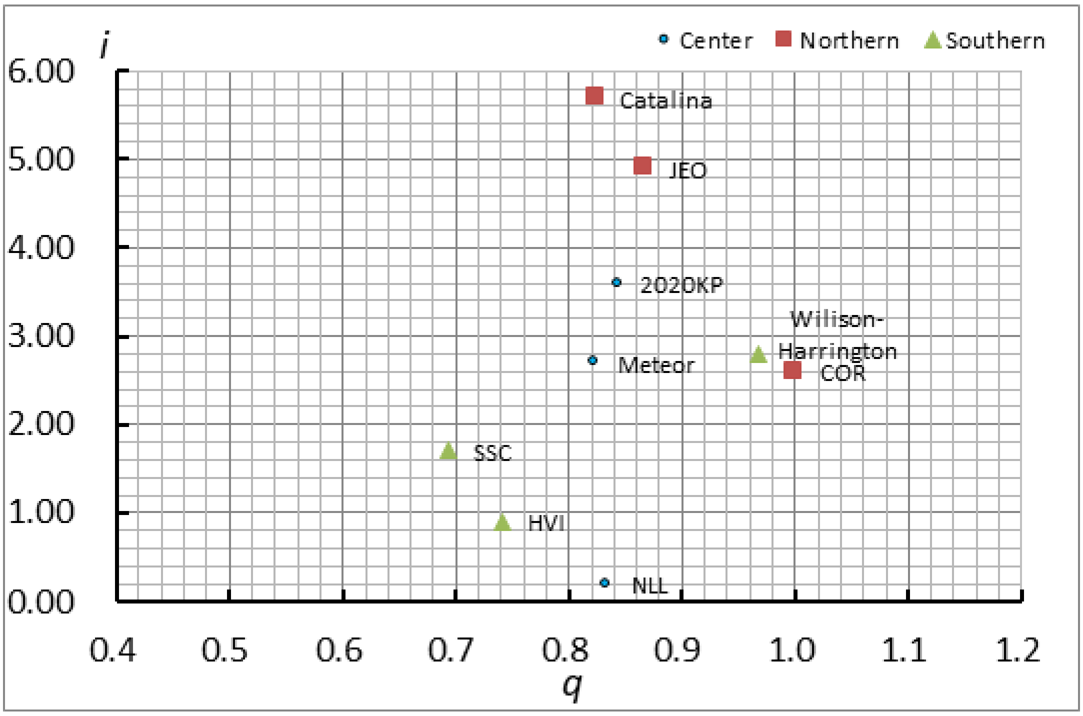

Figure 7 – The diagram with inclination *i* versus perihelion distance *q* plotted using representative values only.

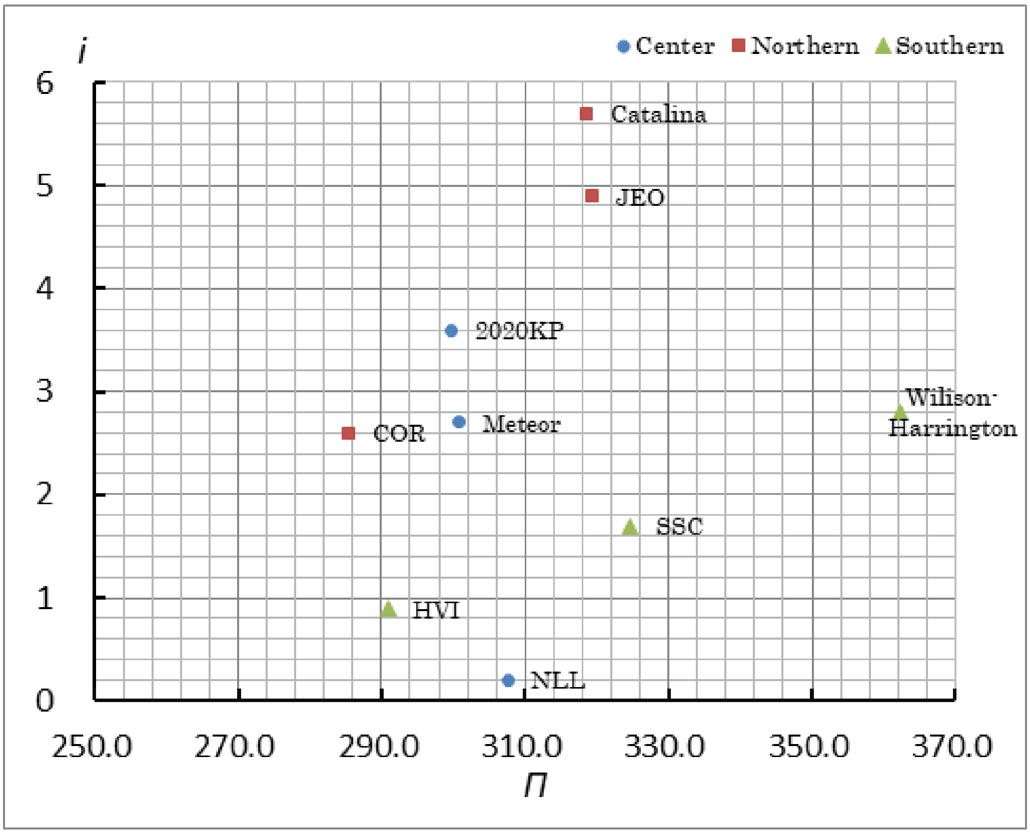

Figure 8 – The diagram with inclination *i* versus longitude of perihelion *Π* plotted using representative values only.

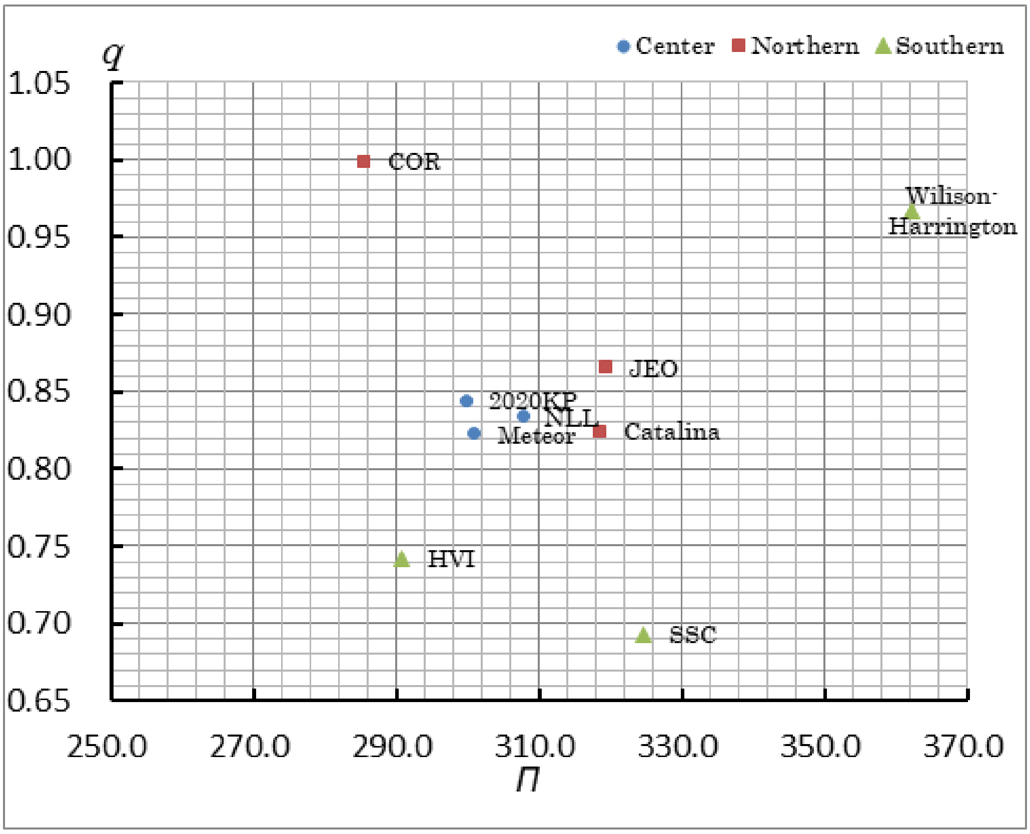

Figure 9 – The diagram with the perihelion distance *q* versus longitude of perihelion *Π* plotted using representative values only.

Figure 6 shows the year-by-year variation of the NLL meteor shower from 2007 to 2026, according to the Sonotaco Network in Japan. Shower classification was done using MRaDV[6] (E<1 off Nr5.0). A total of 20 shower members were classified. From this graph, although the number of meteors is small, a cycle of approximately 5 years appears to be observed (2007 → 2013 → 2019 → 2023).

[6] https://sonotaco.jp/forum/viewtopic.php?t=5905

2 Orbits and parent bodies

The three parent bodies (2020 KP, 300P/Catalina, and 4015 Wilson–Harrington) are clearly separated in the diagram with inclination i versus perihelion distance q (*Figure 7*). The NLL branch associated with 2020 KP is situated at low inclination and moderate perihelion distance. The Catalina–JEO branch is at slightly higher inclinations and moderate to high perihelion distances. The 4015 Wilson–Harrington, COR/HVI branch shows higher inclinations and larger perihelion distances. This indicates that the low-velocity ecliptic meteoroid complex appearing around the same season (node ≃ 59°) is divided into three distinct groups.

The three parent bodies (2020 KP, 300P/Catalina, and 4015 Wilson–Harrington) are clearly separated in the diagram with inclination i versus longitude of perihelion Π (*Figure 8*). The three parent bodies (2020 KP, 300P/Catalina, and 4015 Wilson–Harrington) are clearly separated in the diagram with perihelion distance q versus longitude of perihelion Π (*Figure 9*).

The three candidate parent bodies show a clear hierarchical relationship in physical scale: 4015 Wilson–Harrington > 300P/Catalina > 2020 KP. This size ordering is consistent with the observed structure of the meteor complex.

Compositional correspondence with meteor types

- 2020 KP – Candidate parent of the NLL filament: The orbit of 2020 KP lies entirely within the asteroidal domain. Its reflectance spectrum is dominated by Fe + Ni, with Mg contributing only ~11%, indicating a metal-rich composition. This makes 2020 KP a highly plausible source of the iron-rich meteors characteristic of the NLL group.
- 300P/Catalina – Candidate parent of the JEO/COR northern branch: 300P is a typical Jupiter-family comet (JFC) nucleus, composed of ices, dust, and volatiles. Meteoroids originating from such a body are expected to show more comet-like spectral signatures, including enhanced Na and Mg. This matches the properties of the southern, more cometary branch of the complex.
- 4015 Wilson–Harrington – Large, primitive parent of the entire complex: The reflectance spectrum of 4015 resembles carbonaceous chondrites. Although Fe is present, it is not the type of differentiated metallic core material that would generate predominantly iron meteors. Instead, 4015 is more consistent with producing dark, primitive, stony meteoroids.

A three-layer parentage model

These compositional trends align naturally with the proposed three-layer structure:

- Iron-rich NLL meteors → 2020 KP;
- Comet-like northern branch (JEO/COR) → 300P/Catalina;
- Overarching primitive parent body → 4015 Wilson–Harrington.

Thus, the orbital architecture and the physical composition of the candidate bodies are mutually consistent.

Orbital characteristics of the April–June ecliptic complex

All components of the complex share similar dynamical properties:

- Low inclinations (a few degrees);
- Radiants located near the ecliptic plane (RA ≈ 205–247°, low declination);
- Low to moderate geocentric velocities (v_g = 8–17 km/s).

These features are typical of the April–June ecliptic meteor complex.

Interpretation

The three major branches:

- Northern branch (JEO/COR/300P)
- Central NLL filament (2020 KP)
- Southern branch (SSC/HVI/4015)

can be coherently interpreted as components of a single ecliptic meteor complex active from April to June, with 4015 Wilson–Harrington serving as the upper-level progenitor.

When size, composition, and orbital dynamics are considered together, this interpretation provides a highly plausible and internally consistent framework for understanding the structure of the complex.

A report on the April 6th, 2026, meteorite fall in western Sudan

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This is a report on a witnessed meteorite fall in western Sudan on April 6th, 2026. Eyewitnesses saw a bright fireball in the sky, heard a few seconds later a sonic boom, and after that the sound of a heavy object hitting the ground in the suburbs of Kornoy, a locality close to Tinah, North Darfur. The meteorite had penetrated the ground. Photos of the fall location and the recovered meteorite are presented that show features that match those known from other meteorite falls. The region is currently in the midst of a war and a more comprehensive report is not expected until local circumstances are suitable for further investigations.

1 Introduction

In the night sky, observers can see multiple natural phenomena. A portion of these phenomena can occur instantaneously with no signs of pre-occurrence to alert. It is so obvious that meteors exemplify one of the sky's natural phenomena that can be seen frequently.

A meteor can be seen as a fireball moving fast over a short path in the sky. It is a solid object possibly originating from an asteroid, so when it enters the atmosphere, part of the meteor falls to the ground and is termed a meteorite. Consequently, a meteorite has certain visible and physical features that distinguish it from Earth stones. Some visible features so far have been reported, including: the darker appearance and surface evidence for some burns, in addition, some indication that the stone is rich with metal components, e.g., the texture or a dominating color, e.g., grey or dark- grey colors (Flynn et al., 2018). When these visible features apply to a stone collected, for example, by local people who witnessed the meteor, those features may justify the possibility that the stone is a meteorite. Meteorites are important in studies aimed at understanding the origin of our planetary system. They represent the study samples that were freely provided to us by the lab of nature. So, wherever these meteorites fall, it is necessary to undertake campaigns to collect them. But in exceptional cases of unattainability, it is quite invaluable to report their presence in lands where they fall so that when circumstances are suitable, we can get them for advanced studies.

Here we report the fall of a meteorite from an observed meteor by eyewitnesses. A stone has been collected from the site where eyewitnesses claimed to have seen the meteor. It was collected just the next day after they saw the meteor. Because of the factual circumstances of war in the area, we are unable to organize a campaign to reach there and get the meteorite. Nevertheless, some amateurs and specialists from the area where the meteorite fell are now exerting efforts to keep the meteorite safe for future characterization tests using physical tools and methods.

2 Overview about meteorites

Fireball-like objects in the sky

Meteors appear frequently in the sky. Some of these meteors are bright fireball-like objects that move very fast from one point to another and fade away. The essence of the origin of meteors is related to the theory of evolution of our solar system, which implies that some frozen remnants of the formation products remain as meteoroids in unpredictable orbits around the Sun. When they get close to a planet they may collide with the atmosphere of the planet, interact with the particles of the atmosphere and produce light trails visible as meteors from the surface of the planet. Larger meteoroids produce very bright meteors known as fireballs. Most of the meteoroid mass sublimates by the friction with the atmosphere. When a part of it survives its transit through the atmosphere, it may reach the surface and can be collected as a meteorite.

Features of meteorites for a quick test on a stone

According to theories of the formation of our solar system, meteorites originate from remnants of the early formation; therefore, they can originate from either asteroids or stone debris found within the solar system, e.g., in the Kuiper belt. These meteorites can have visual features and physical properties that are useful for identifying meteorites. Visible features of meteorites are: a black or brown crust as a result of fusion, which results from the impact when the meteor enters the atmosphere, shallow depression signs that resemble thumbprints on a clay, and an irregular shape. On the other hand, the physical features include, but are not limited to, bulk grain density, magnetic properties, and the lack of bubbly appearance (Flynn et al., 2018). These unique visible features of meteorites can serve as preliminary evidence when a fireball is eye-witnessed with claims of hearing the impact on the ground on the same night.

3 Kornoy's April 6th meteorite

Recently, in western Sudan, local people witnessed a fireball event and hunted for the stone that fell from the sky.

These people, the original inhabitants, were accustomed to hearing blasts and seeing lightning-like flashes in the sky because the country is currently at war. On the day of the fireball event and the meteorite fall, their experience was quite different, since it was a natural phenomenon. According to eyewitnesses, it happened on the 6th of April, 2026, in the suburbs of Kornoy, a locality in western Sudan, near Tinah in North Darfur State. The inhabitants there have seen a very bright light in the sky, and after a few seconds, they have heard a sort of blasting sound, and some of them have heard something impacting the ground with a lot of force. Probably, for those who are acquainted with natural phenomena like this and who lived close to where the fireball was seen, they had concluded that a meteorite had fallen in the Kornoy area. Probably hunting for a meteorite would add a valuable contribution to our recent studies on the history of formation of the planetary system. The fact that the stone collected by the local people is probably a meteorite can be deduced when carefully examining the following figures, in sequence, starting from *Figure 1*, to *Figure 3*. These figures show the stone with a black external surface and a grey internal, and an irregular shape, together the crater made by the meteorite. Obviously, the aforementioned visible features observed on the stone at Kornoy imply that the stone can be satisfactorily addressed as a meteorite.

To validate the local people's observation of the fireball, we relied on the meteor map to examine whether any station had recorded this event (Dijkema, 2022). *Figure 4* shows a screenshot of the meteor map on April 6th, 2026. It is obvious that the stations shown in the top left of the map recorded meteors but all stations appear to be too far from the fall location to detect the fireball.

Figure 1 – The meteorite at Kornoy collected and photographed by local people in Kornoy.

Figure 2 – The meteorite at Kornoy, a close-up photo shows a broken part recorded by local people in Kornoy.

Figure 3 – The crater formed by the meteorite at Kornoy photographed by local people in Kornoy.

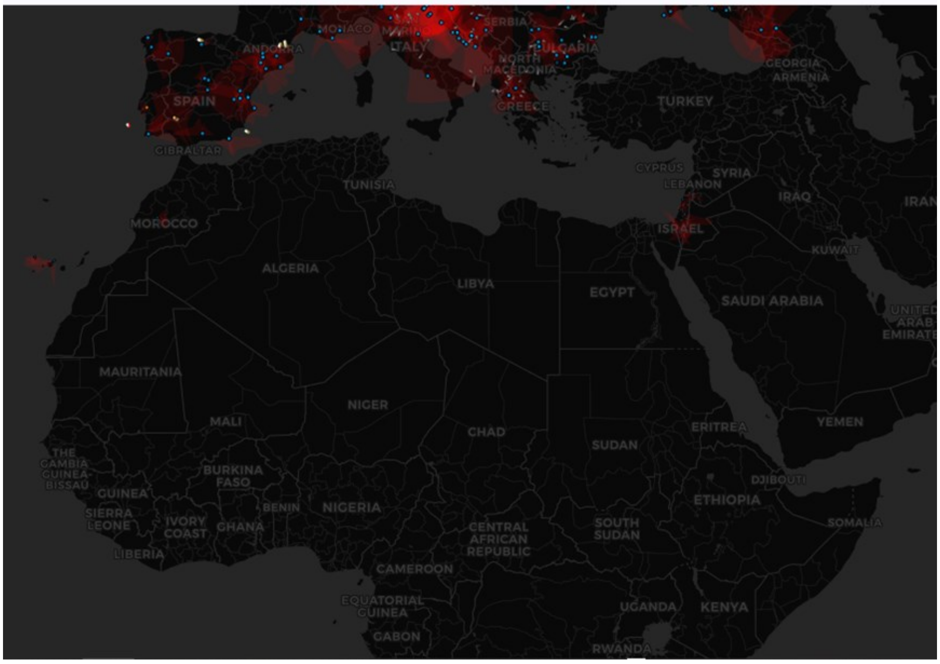

Figure 4 – The meteor map, on the top left part of the figure show stations that recorded meteors.

4 Conclusion

We conclude that a meteorite fell near Kornoy, Sudan, on April 6th, 2026. When circumstances are convenient for a campaign in the Kornoy area, it would be necessary to undertake an expedition to obtain the meteorite or a sample from it for further studies.

Acknowledgment

We acknowledge a group of young local people for their cooperation with us by providing us with the photos and some videos of their hunt for the meteorite fall in the suburb of Kornoy, despite the circumstances of the war and the insecurity they were able to go to the field in the area of the meteorite fall and followed instructions from amateurs and other specialists to collect the meteorite and take proper photos of the stone.

References

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April 2026 CARMELo report

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The CARMELo network (Cheap Amateur Radio Meteor Echoes LOgger) is a collaboration of SDR radio receivers aimed at detecting meteor echoes. This report presents the data for April 2026.

1 Introduction

April is the first spring month to feature prominent meteor showers, particularly the Lyrids (LYR). However, activity was fairly moderate. On April 23, however, a fireball was observed across much of Europe, an event of great significance and impact.

2 Methods

The CARMELo network consists of SDR radio receivers. In them, a microprocessor (Raspberry) performs three functions simultaneously:

- By driving a dongle, it tunes the frequency on which the transmitter transmits and tunes like a radio, samples the radio signal and through the FFT (Fast Fourier Transform) measures frequency and received power.
- By analyzing the received data for each packet, it detects meteor echoes and discards false positives and interference.
- It compiles a file containing the event log and sends it to a server.

The data are all generated by the same standard, and are therefore homogeneous and comparable. A single receiver can be assembled with a few devices whose total current cost is about 210 euros.

To participate in the network read the instructions on this page[7].

3 April data

In the plots that follow, all available at this page[8], the abscissae represent time, which is expressed in UT (Universal Time) or in solar longitude (Solar Long), and the ordinates represent the hourly rate, calculated as the total number of events recorded by the network in an hour divided by the number of operating receivers.

In *Figure 1*, the trend of signals detected by the receivers for the month of April.

4 Lyrids

The Lyrids are a meteor shower that occurs every year in April, with a peak usually around the 22nd of the month. It is one of the oldest meteor showers ever observed and the one with the longest continuous historical record, with observations dating back to at least 687 B.C. (Martínez Usó et al., 2023).

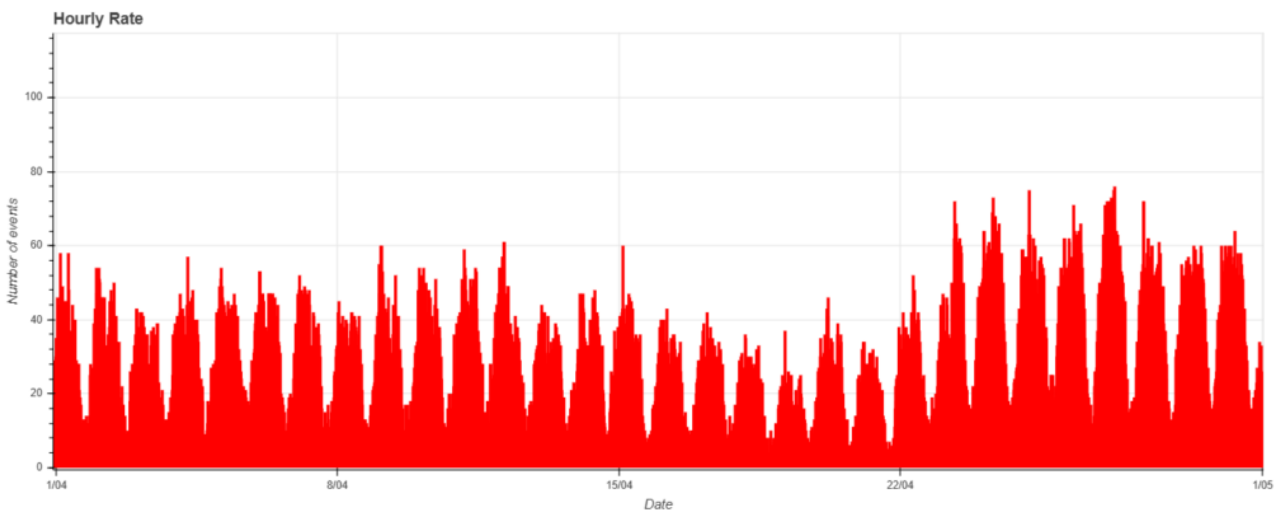

Figure 1 – April 2026 data trend.

[7] http://www.astrofiliabologna.it/about_carmelo

[8] http://www.astrofiliabologna.it/graficocarmelohr

The parent body was identified in the 19th century as Comet C/1861 G1 (Thatcher), which takes approximately 415 years to complete an orbit around the Sun. The meteors of this shower have their radiant in the constellation Lyra, near the bright star Vega. The Lyrids are distinguished by their speed (about 49 km/s) and their ability to produce bright, persistent trails in the sky.

Typically, about 15–20 meteors per hour can be seen, but much higher peaks have occasionally been recorded, which were believed to be associated with the parent comet's proximity to Earth. However, studies conducted at the end of the 20th century have refuted this direct correlation and suggest that the outbursts may instead be linked to dynamical resonances or dense regions of material within the comet's tail (Martínez Usó et al., 2023).

One of the most intense events was the 1803 outburst, with an estimated hourly rate of about 860, which attracted considerable astronomical interest. A more recent one occurred in 1982, when up to 90 meteors per hour were recorded (Porubcan and Cevolani, 1985).

In 2026, the meteor shower's activity was fairly moderate, with no real visible peak. This can be seen in the CARMELo network graph in *Figure 1*, but it was also noted in the CMOR data. Video observations from the Global Meteor Network show that the peak was fairly low this year[9]. Activity was also not intense last year (Maglione and Barbieri, 2025).

5 Fireball on April 23

A fireball is a particularly bright meteor. These are small rocky fragments (meteoroids) that enter Earth's atmosphere at extremely high speeds. Friction with the air heats them up until they glow intensely, creating very bright trails and, in the most energetic cases, trails that are even colored or persist for a few seconds.

The fireball observed on the evening of April 23, 2026, at 22h45m53s UT (00h45m53s local time in Italy) was one such spectacular event. It was seen across much of Europe, from Germany to Italy, with approximately 350 reports collected by the International Meteor Organization[10]. Many witnesses described a luminous trail lasting about 3–4 seconds, silent but with very vivid, greenish colors (*Figure 2*). In some areas, such as Liguria, the glow was so intense that it lit up the landscape almost as if it were daytime.

Despite the magnitude of the event, not all observation networks were able to record it in its entirety. The Global Meteor Network and the PRISMA network of the National Institute of Astrophysics did not provide data useful for accurately reconstructing its trajectory. It was, however, observed by 12 cameras of the FRIPON network over the Tyrrhenian Sea: its trail lit up at an altitude of about 87 km and faded at about 48 km. It reached an absolute magnitude of –13 at an altitude of about 68 km. Its speed was approximately 29 km/s. The reconstruction of its orbit describes a body with a moderate inclination and an aphelion just beyond Mars' orbit, with a semi-major axis of less than 3 AU (Astronomical Units). It was therefore not a Lyrid.

Figure 2 – The fireball of April 23, 2026, as seen from Vence, France. Credits: Sylvain R./IMO.

The CARMELo network also did not directly detect the fireball's passage at the exact moment of the event. This can happen: to observe a meteor using the radio method, a specific alignment between the transmitter, the ionized trail, and the receiver is required. If this alignment is not favorable, the echo is not recorded, even if the phenomenon is very bright.

In the 15 seconds following the fireball, however, the CARMELo network recorded as many as 21 radio echoes of varying intensity. How can this be explained?

Let's assume that such a powerful event created a very extensive and "dense" ionization trail, which consequently dissipated through reionization over a much longer period than that of a meteor of ordinary size. In the seconds that followed, winds in the upper atmosphere may have distorted and broken this trail into several pieces. Some of these "fragments" then found themselves, even if only for brief moments, in the right position to reflect the radio signal toward our receivers.

[9] https://globalmeteornetwork.org/flux/plots/flux_LYR_sol%3D30.00-34.00_year_2026_full.png

[10] https://fireballs.imo.net/members/imo_view/event/2026/3042?org=imo

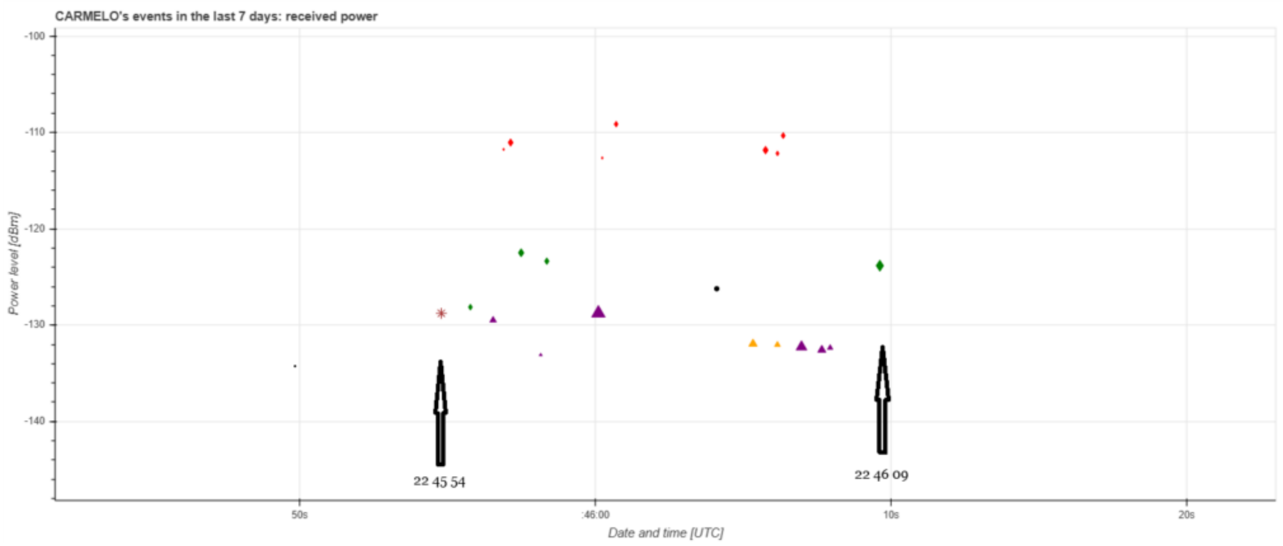

Figure 3 – Radio echoes detected by the CARMELo network between $22^h45^m54^s$ UT and $22^h46^m09^s$ UT on April 23, 2026.

In this way, even without a main echo, the fireball left a clearly recognizable radio trail that extended over time. This is an interesting phenomenon, suggesting a particularly energetic and complex event (*Figure 3*).

6 The CARMELo network

The network currently consists of 16 receivers located in Italy, the UK, Switzerland and the USA. The European receivers are tuned to the Graves radar station frequency in France, which is 143.050 MHz. Participating in the network are:

- Lorenzo Barbieri, Budrio (BO) ITA;
- Associazione Astrofili Bolognesi, Bologna ITA;
- Associazione Astrofili Bolognesi, Medelana (BO) ITA;
- Paolo Fontana, Castenaso (BO) ITA;
- Associazione Astrofili Pisani, Orciatico (PI) ITA;
- Gruppo Astrofili Persicetani, San Giovanni in Persiceto (BO) ITA;
- Roberto Nesci, Foligno (PG) ITA;
- MarSEC, Marana di Crespadoro (VI) ITA;
- Gruppo Astrofili Vicentini, Arcugnano (VI) ITA;
- Associazione Ravennate Astrofili Rheyta, Ravenna (RA) ITA;
- Mike German a Hayfield, Derbyshire UK;
- Mike Otte, Pearl City, Illinois USA.
- Yuri Malagutti, Comano (TI) CH.
- Leslie Fry, Trawscoed Ceredigion, Wales UK
- Brian Coleman, Redenham Observatory, Andover, England UK
- Radio club La Salle University, Barcellona ESP

The authors' hope is that the network can expand both quantitatively and geographically, thus allowing the production of better-quality data.

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May 2026 CARMELo report

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The CARMELO network (Cheap Amateur Radio Meteor Echoes LOgger) is a collaboration of SDR radio receivers aimed at detecting meteor echoes. This report presents the data for May 2026.

1 Introduction

May is the month of the eta-Aquariids. The peak, expected on May 7, was not particularly pronounced. To analyze the shower's activity, we used a new algorithm that attempts to distinguish the eta-Aquariids' contribution from that of sporadic meteors.

2 Methods

The CARMELO network consists of SDR radio receivers. In them, a microprocessor (Raspberry) performs three functions simultaneously:

- By driving a dongle, it tunes the frequency on which the transmitter transmits and tunes like a radio, samples the radio signal and through the FFT (Fast Fourier Transform) measures frequency and received power.
- By analyzing the received data for each packet, it detects meteor echoes and discards false positives and interference.
- It compiles a file containing the event log and sends it to a server.

The data are all generated by the same standard, and are therefore homogeneous and comparable. A single receiver can be assembled with a few devices whose total current cost is about 210 euros.

To participate in the network read the instructions on this page[11].

3 May data

In the plots that follow, all available at this page[12], the abscissae represent time, which is expressed in UT (Universal Time) or in solar longitude (Solar Long), and the ordinates represent the hourly rate, calculated as the total number of events recorded by the network in an hour divided by the number of operating receivers.

In *Figure 1*, the trend of signals detected by the receivers for the month of May.

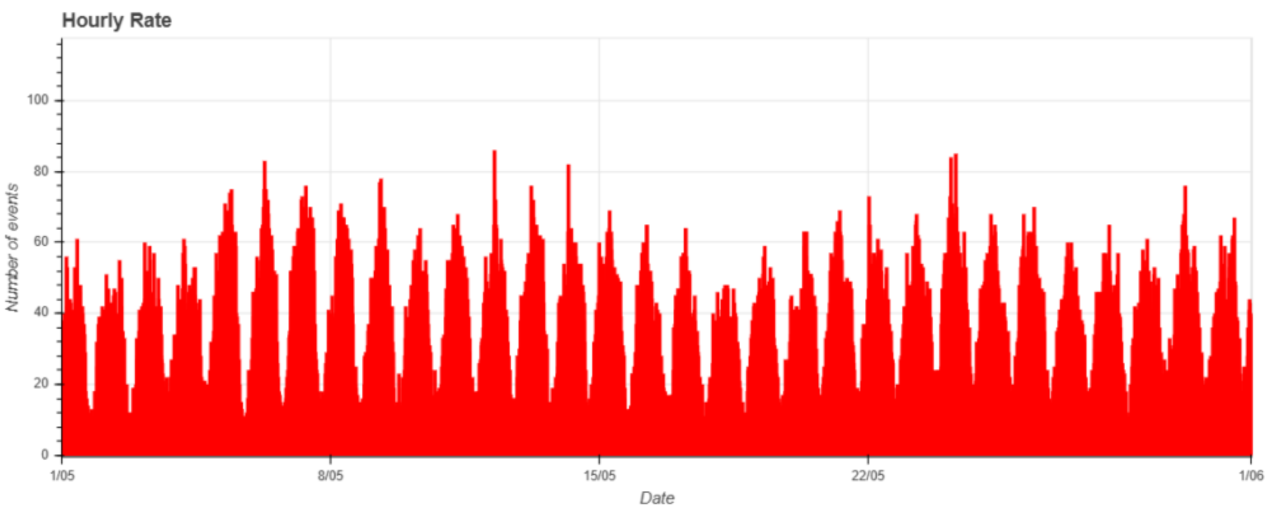

Figure 1 – May 2026 data trend.

[11] http://www.astrofiliabologna.it/about_carmelo

[12] http://www.astrofiliabologna.it/graficocarmelohr

4 Eta-Aquariids

The eta-Aquariids (ETA) are a meteor shower active every year between mid-April and late May, with peak activity around May 6. Although less spectacular than more well-known showers, the eta-Aquariids hold particular significance due to their origin: the fragments that make them up come from the famous Halley's Comet, the same one that also gives rise to the Orionids in October (Egal et al., 2020).

The radiant of the meteor shower is located in the constellation Aquarius, near the star Eta Aquarii, from which it takes its name. At our latitudes, this point rises shortly before dawn, around 3:30 a.m. local time, making the late hours of the night the best time for observation and recording. Due to the radiant's low position on the horizon, the number of meteors visible in Italy is generally limited to about 30–40 per hour. In southern regions, where the radiant rises much higher above the horizon, the shower offers a far more intense spectacle, with hourly rates at the zenith (ZHR) that can exceed 50–60 meteors per hour.

The eta-Aquariids are also notable for the high speed of their meteors, which can reach over 66 km/s. This makes their trails in the sky particularly bright and long-lasting, with trails that sometimes linger for several seconds. The peak of activity usually occurs during the first week of May; this year, it was expected on May 7.

5 The construction of RZHR

By RZHR (Radio Zenithal Hourly Rate), we mean the hourly rate of radio meteors in a shower, calculated by processing data from meteor scatter receivers.

This tool allows us to make a significant leap in quality, moving away from the qualitative analysis we have conducted so far (which relied exclusively on graphs) and transitioning to the direct processing of data from our database. To do this, we developed a Python script with the help of the "Cursor" tool, an AI-powered code editor created by Anysphere. This support proved crucial in developing a satisfactory script.

First, it should be clarified that, in calculating the RZHR, we make certain approximations, including:

- We do not take into account that the varying geographical distribution of receivers causes them to "see" meteors from slightly different angles.
- We disregard the fact that observations are not isotropic but are influenced by antenna pointing, which favors a specific sector of the sky over the entire sky.
- We define a contribution as "sporadic" even though it may also include meteors from small showers.

The algorithm for this calculation uses data from the database of all meteors recorded by the CARMELo network. First, it asks the user to identify certain days on which no significant meteor shower activity is expected. These days are selected as close as possible to the date being analyzed. This data is then averaged to form a second database called the "sporadic average".

This database is then subtracted from the one for the days under examination, during which a meteor shower is presumed to be present. Any negative values are eliminated, and the profile is smoothed using a smoothing function.

The figure is then divided by the sine of the radiant's altitude above the horizon, calculated for an average Italian location in the same way as the algorithm used to calculate the ZHR (Zenithal Hourly Rate), which, as we recall, is:

$$ZHR = \frac{N \cdot r^{6.5-lm}}{\sin h_R \cdot F \cdot T_{eff}}$$

Where:

- *N*: number of meteors counted.
- L_m: the limiting magnitude of a star that is visible to the observer.
- *r*: shower's density (the ratio indicating how many more meteors are visible for each magnitude; typically ranging from 2.0 to 3.5).
- h_r: angular height of the radiant above the horizon in degrees.
- T_{eff}: actual observation time (in hours).
- *F*: field-of-view correction factor.

The temporal resolution, which is 15 minutes in the original data, is retained at that value; therefore, the term *H* in RZHR should be considered as *H/4*.

Figure 2 shows the artificial sample of sporadic events derived from observational data and used as a reference for the subsequent subtraction.

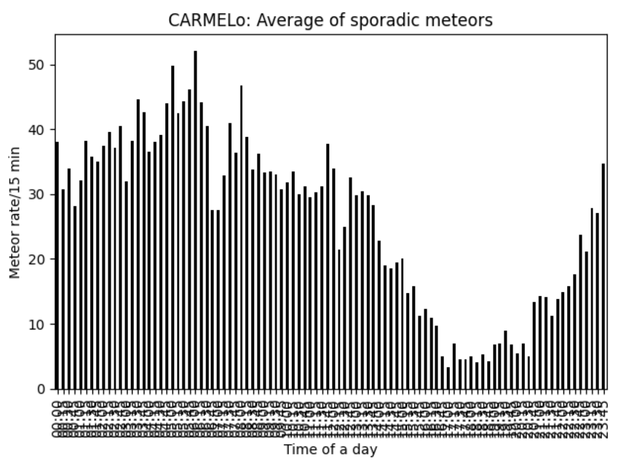

Figure 2 – Average number of sporadic meteors for the month of May 2026.

The results of the analysis are shown in *Figure 3*, which displays the residual distribution of the events alongside the position of the eta-Aquariids radiant. However, interpreting the data requires particular caution. The eta-Aquariids are, in fact, a rather diffuse meteor shower spread over an extended time interval. Furthermore, as mentioned above, at our latitudes the radiant reaches only modest heights above the horizon and is observable only in the hours preceding dawn.

For these reasons, it is not possible to attribute the entire residual signal with certainty to the eta-Aquariids. With all due caution, however, this residual can be considered an estimate of the shower’s contribution.

To test the robustness of the result, all meteors observed less than 10° above the horizon were excluded from the analysis in *Figure 4*. Even in this case, a signal consistent with the one shown in the previous graph remains.

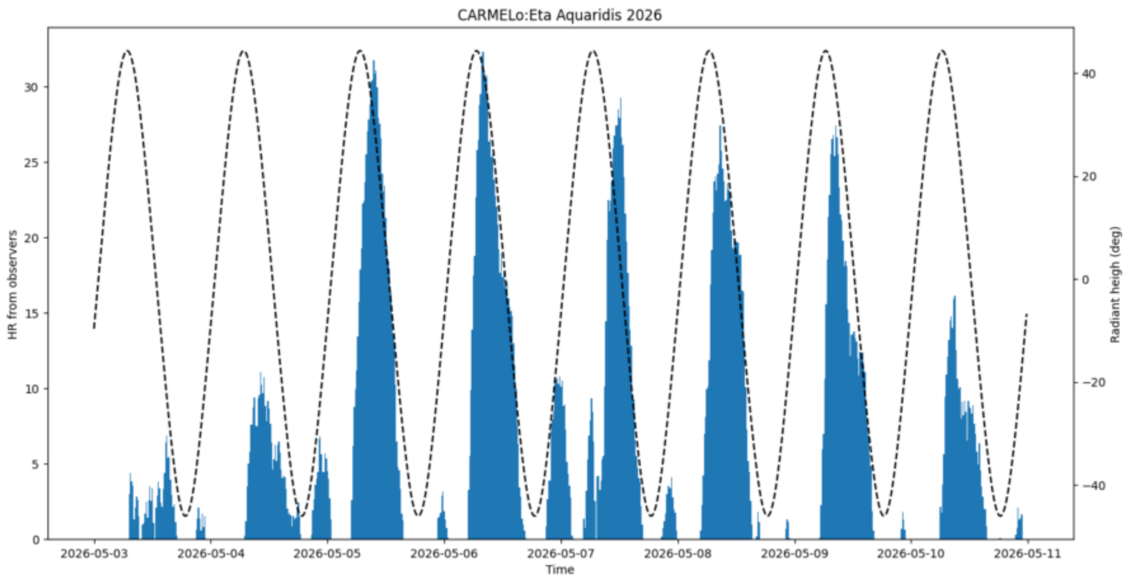

Figure 3 – Residual distribution of events and position of the radiant of the eta-Aquariids.

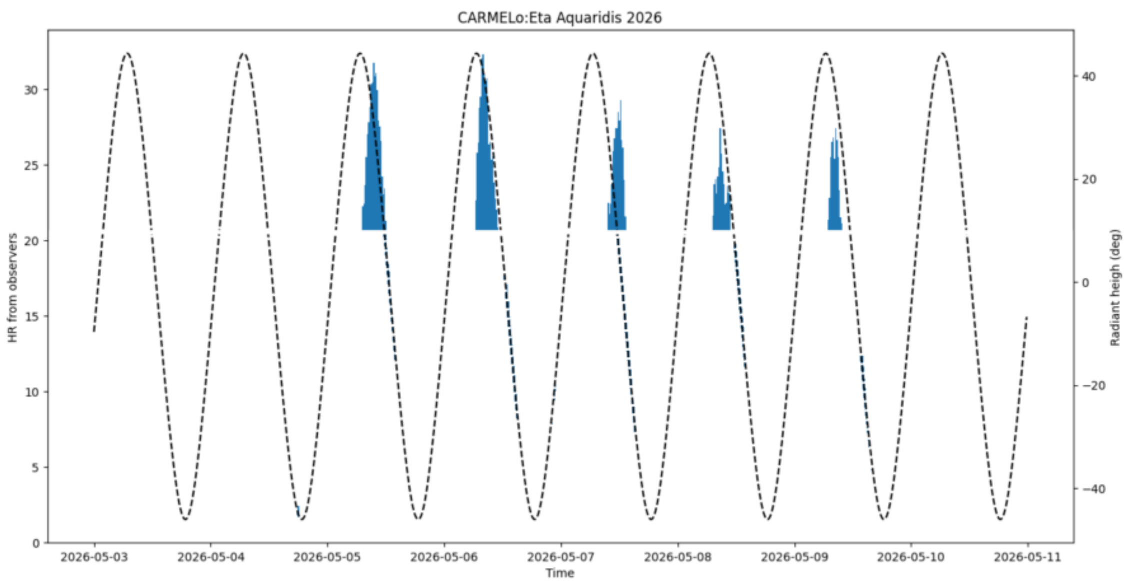

Figure 4 – Residual distribution of events and radiant position of the eta-Aquariids, excluding all meteors observed less than 10° above the horizon.

Finally, by focusing on the predicted peak date, May 7, and using solar longitude as the x-axis, we obtain the distribution shown in *Figure 5*. This reveals a peak in activity at solar longitude 46.6°. This value is consistent with both the forecasts and the results obtained by other observational networks, including the GMN (Global Meteor Network) project.

6 The CARMELO network

The network currently consists of 16 receivers located in Italy, the UK, Switzerland and the USA. The European receivers are tuned to the Graves radar station frequency in France, which is 143.050 MHz. Participating in the network are:

- Lorenzo Barbieri, Budrio (BO) ITA;
- Associazione Astrofili Bolognesi, Bologna ITA;
- Associazione Astrofili Bolognesi, Medelana (BO) ITA;
- Paolo Fontana, Castenaso (BO) ITA;
- Associazione Astrofili Pisani, Orciatico (PI) ITA;
- Gruppo Astrofili Persicetani, San Giovanni in Persiceto (BO) ITA;
- Roberto Nesci, Foligno (PG) ITA;
- MarSEC, Marana di Crespadoro (VI) ITA;
- Gruppo Astrofili Vicentini, Arcugnano (VI) ITA;
- Associazione Ravennate Astrofili Rheyta, Ravenna (RA) ITA;
- Mike German a Hayfield, Derbyshire UK;
- Mike Otte, Pearl City, Illinois USA.
- Yuri Malagutti, Comano (TI) CH.
- Leslie Fry, Trawscoed Ceredigion, Wales UK
- Brian Coleman, Redenham Observatory, Andover, England UK
- Radio club La Salle University, Barcellona ESP

The authors' hope is that the network can expand both quantitatively and geographically, thus allowing the production of better-quality data.

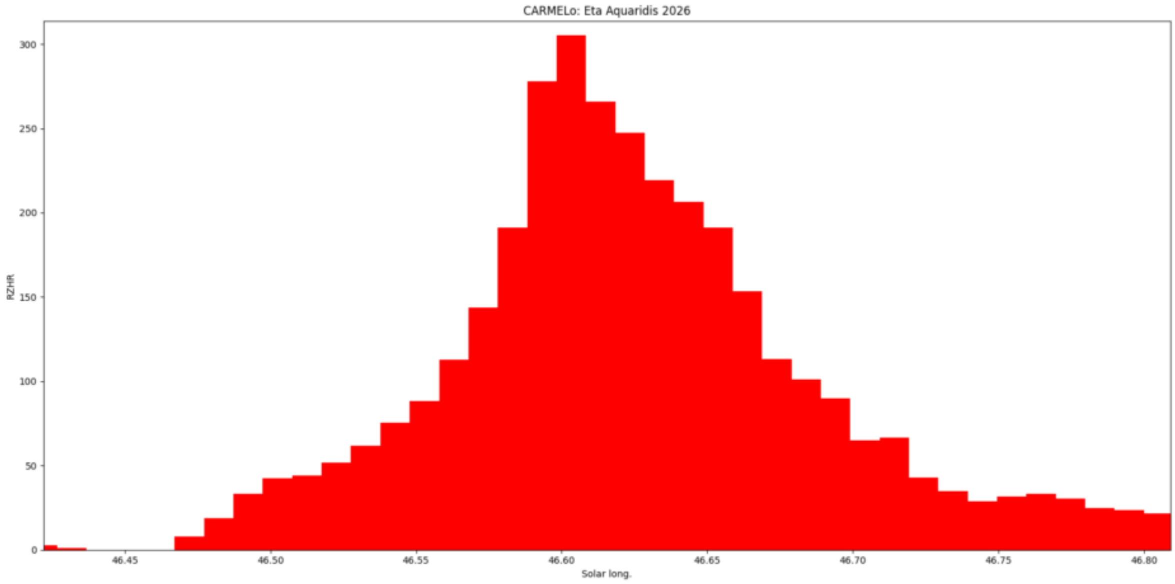

Figure 5 – Residual distribution of events on May 7, 2026, with solar longitude on the x-axis.

References

Egal A., Brown P.G., Rendtel J., Campbell-Brown M., Wiegert P. (2020). "Activity of the eta-Aquariid and Orionid meteor showers". *Astronomy & Astrophysics*, **640**, A58.

Roggemans P. (1989). IMO Handbook for Visual Meteor Observations, Sky Publishing Co.

Radio meteors April 2026

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An overview of the radio observations during April is given.

1 Introduction

The graphs show both the daily totals (*Figure 1 and 2*) and the hourly numbers (*Figure 3 and 4*) of "all" reflections counted automatically, and of manually counted "overdense" reflections, overdense reflections longer than 10 seconds and longer than 1 minute, as observed here at Kampenhout (BE) on the frequency of our VVS-beacon (49.99 MHz) during the month of April 2026.

The hourly numbers, for echoes shorter than 1 minute, are weighted averages derived from:

$$N(h) = \frac{n(h-1)}{4} + \frac{n(h)}{2} + \frac{n(h+1)}{4}$$

Local interference and unidentified noise remained very limited, and no significant lightning activity was recorded. However, there were several fairly strong solar flares, mostly type III, such as on April 25 between 14^h25^m and 14^h55^m UT (*Figure 5*).

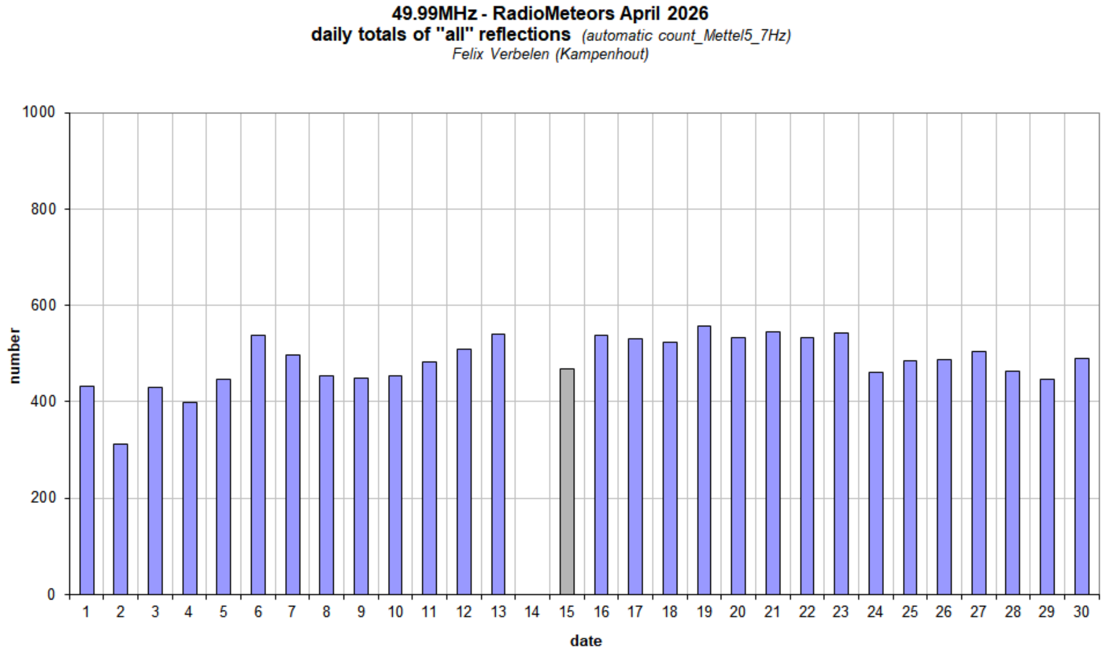
Due to maintenance work, the beacon was deactivated on April 14 between 07^h48^m–11^h33^m UT and 13^h15^m–13^h22^m UT, as well as during several brief periods on April 15.

Meteor activity remained fairly limited this month, although it showed an upward trend, with increased activity on April 6 and the expected return of the Lyrids which reached their peak on April 22–23.

Throughout the month, 8 reflections lasting longer than one minute were observed. A selection of some notable or strong reflections is shown in *Figures 6 to 15*. Many more are available upon request.

In addition to the usual graphs, you will also find the raw counts in cvs-format[13] from which the graphs are derived. The table contains the following columns: day of the month, hour of the day, day + decimals, solar longitude (epoch J2000), counts of "all" reflections, overdense reflections, reflections longer than 10 seconds and reflections longer than 1 minute, the numbers being the observed reflections of the past hour.

[13] https://www.emeteornews.net/wp-content/uploads/2026/05/202604_49990_FV_rawcounts.csv



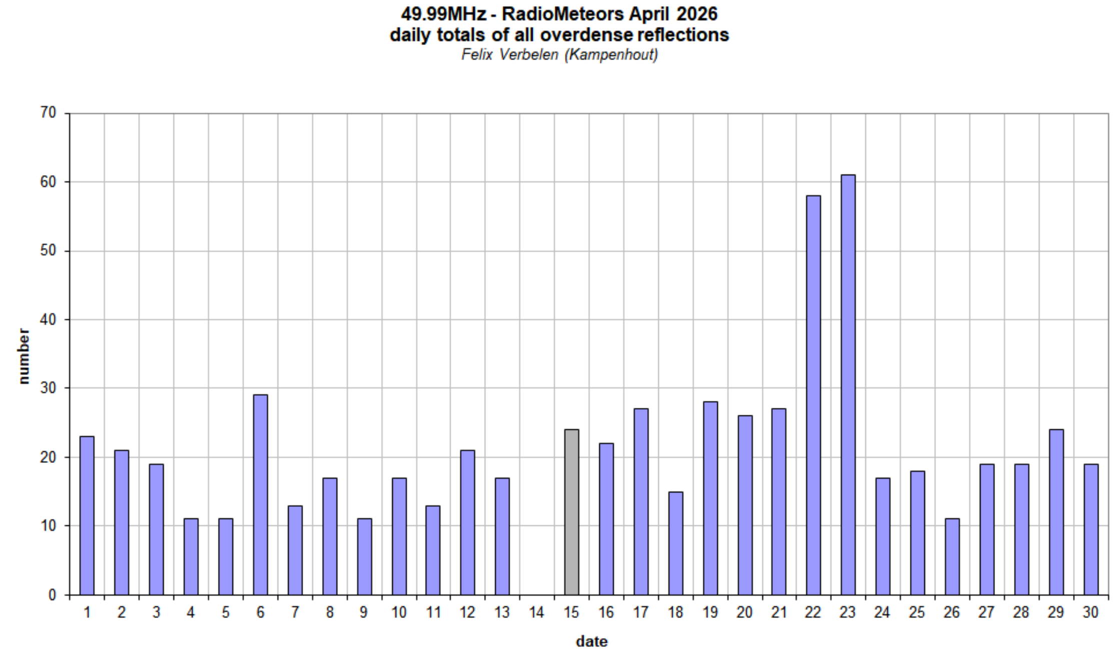
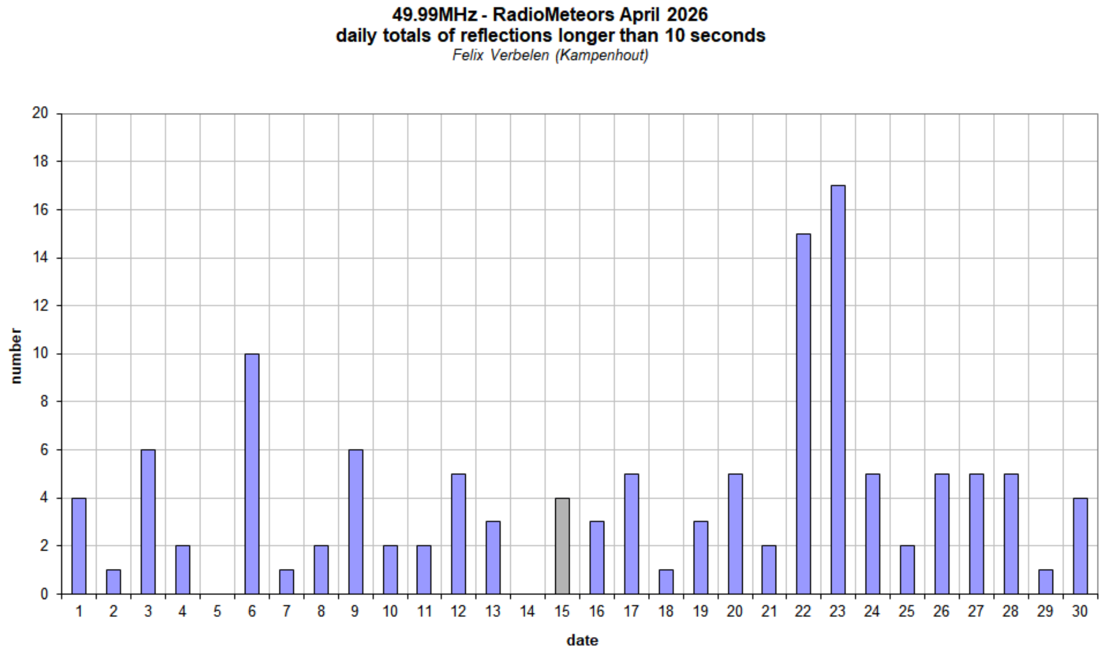


Figure 1 – The daily totals of "all" reflections counted automatically, and of manually counted "overdense" reflections, as observed here at Kampenhout (BE) on the frequency of our VVS-beacon (49.99 MHz) during April 2026.



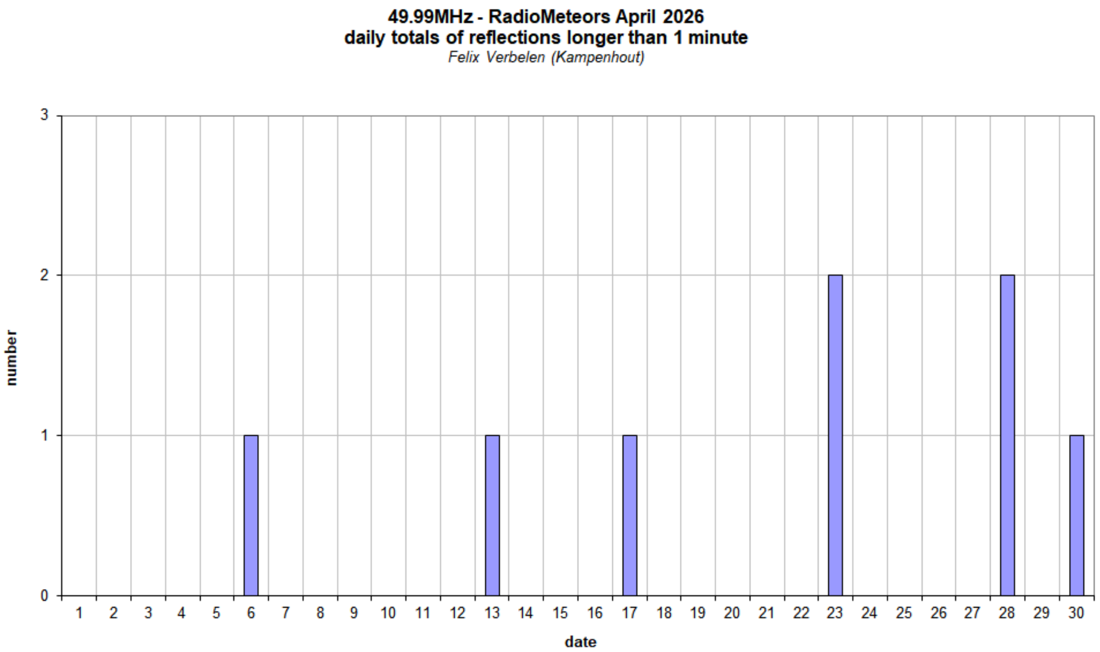
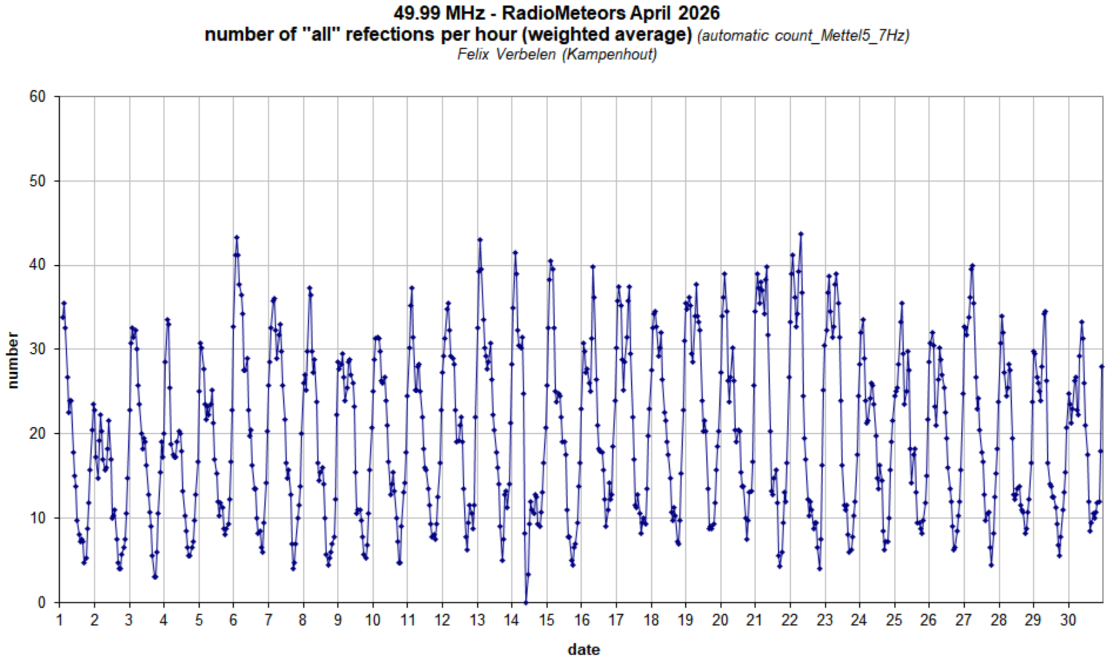
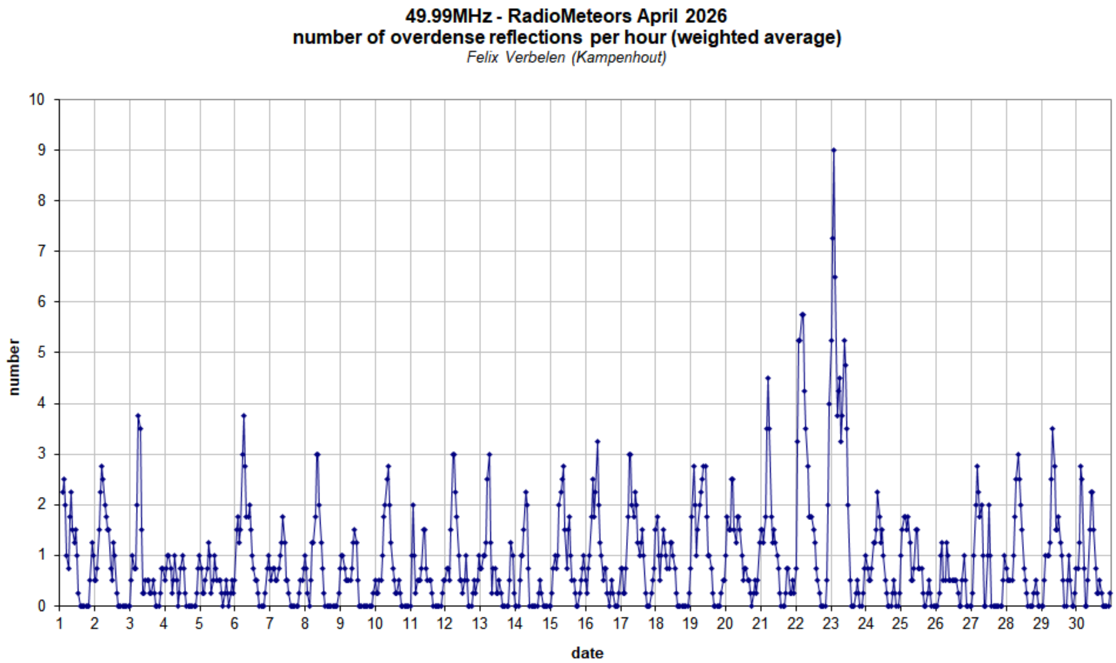


Figure 2 – The daily totals of overdense reflections longer than 10 seconds and longer than 1 minute, as observed here at Kampenhout (BE) on the frequency of our VVS-beacon (49.99 MHz) during April 2026.





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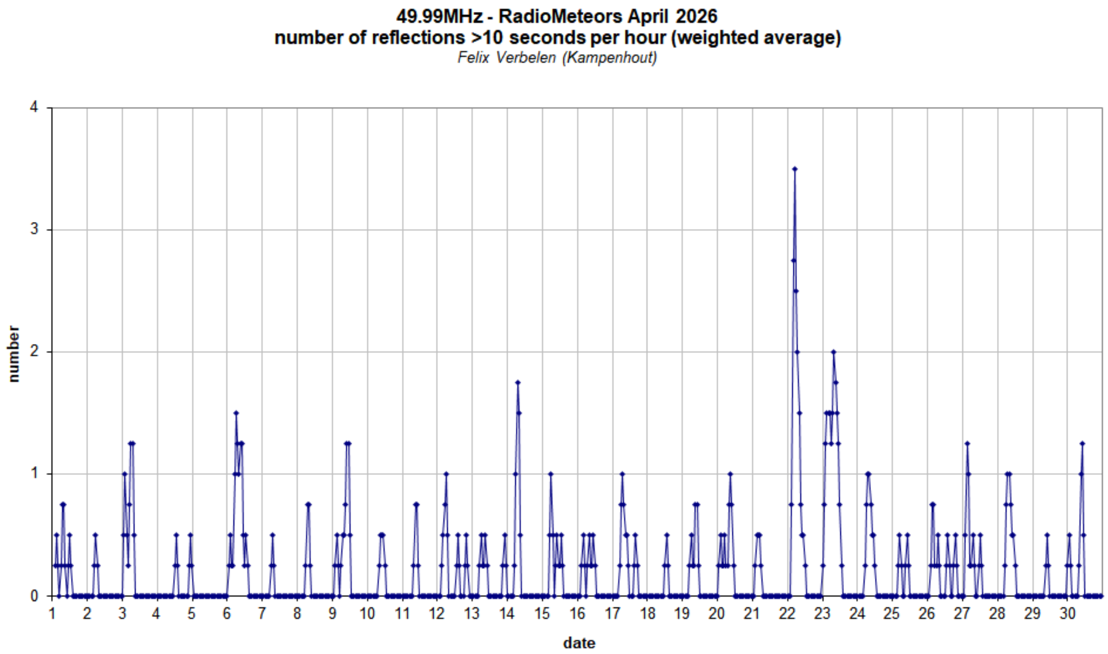

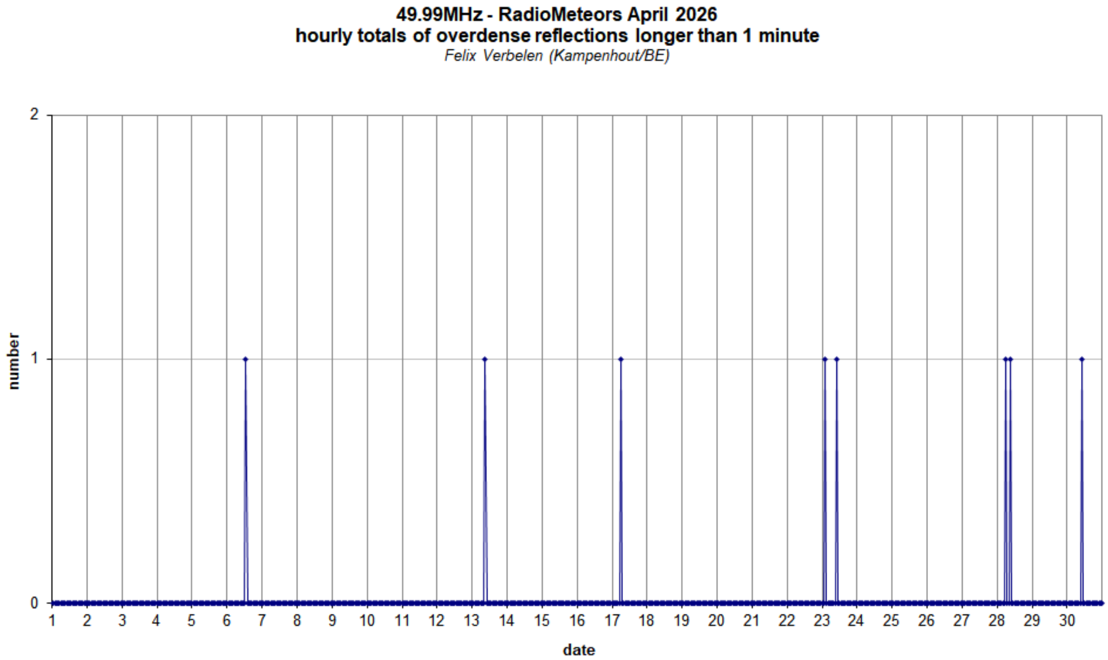

Figure 4 – The hourly numbers of overdense reflections longer than 10 seconds and longer than 1 minute, as observed here at Kampenhout (BE) on the frequency of our VVS-beacon (49.99 MHz) during April 2026.

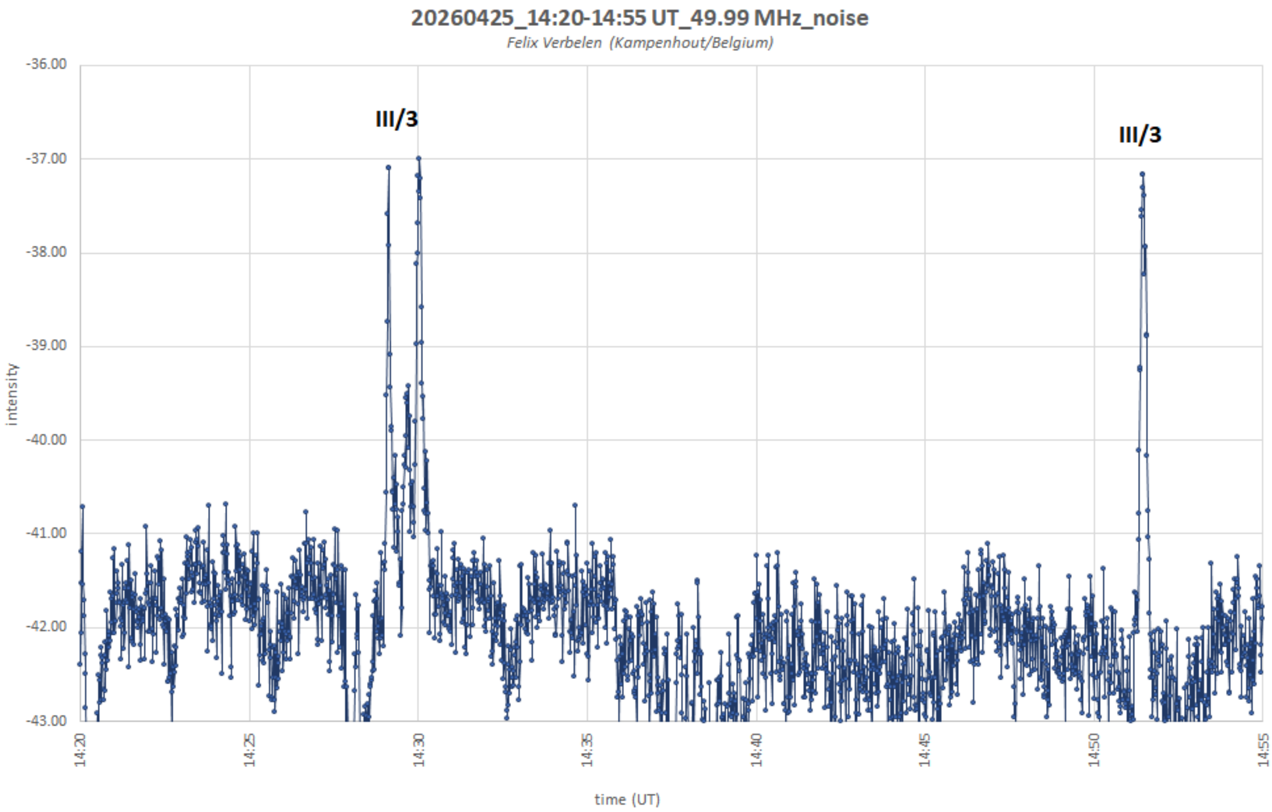

Figure 5 – Strong solar flares, type III, on April 25 between 14^h25^m and 14^h55^m UT.

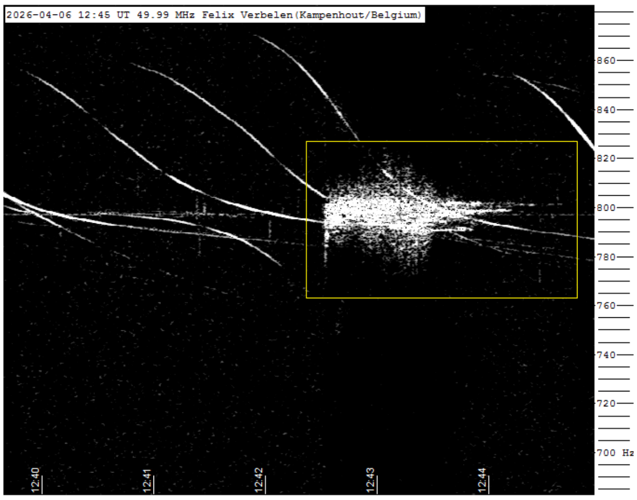

Figure 6 – Meteor echo April 06, 12^h45^m UT.

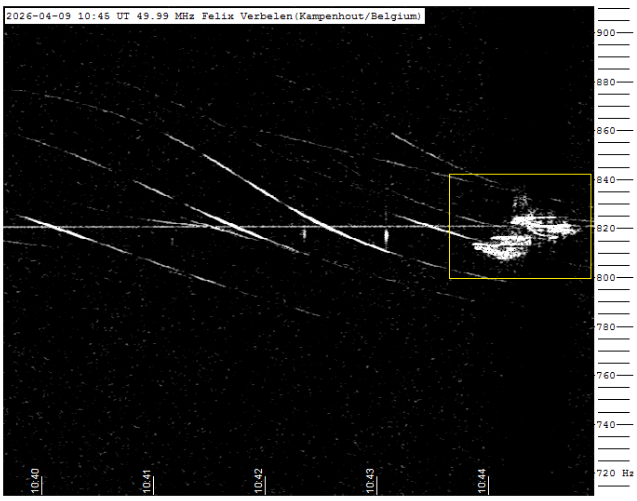

Figure 7 – Meteor echo April 09, 10^h45^m UT.

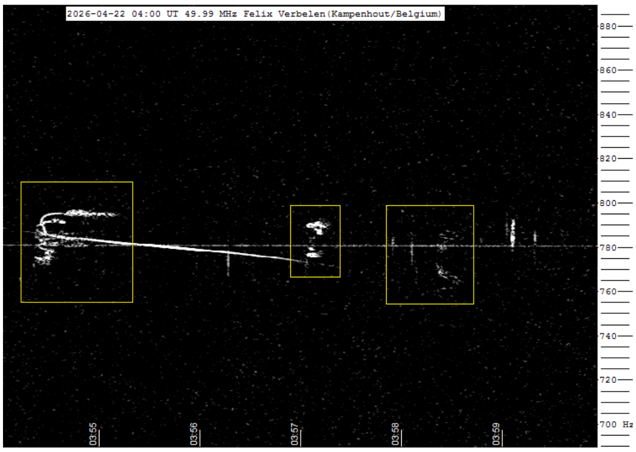

Figure 8 – Meteor echo April 22, 04^h00^m UT.

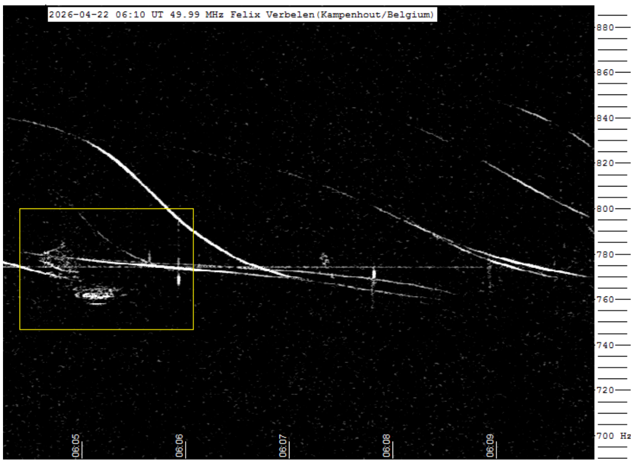

Figure 9 – Meteor echo April 22, 06^h10^m UT.

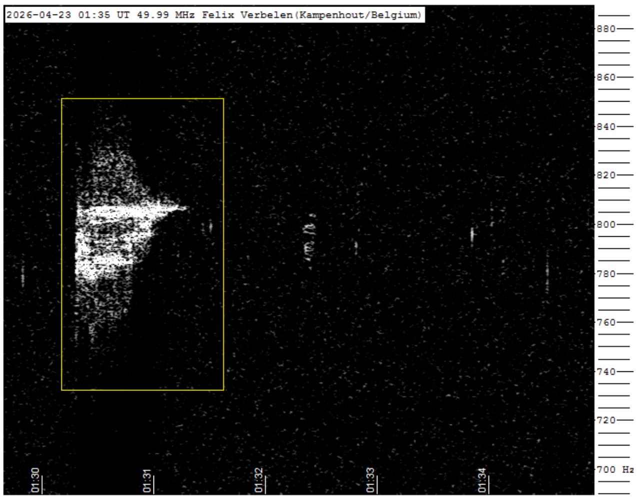

Figure 10 – Meteor echo April 23, 01^{h}35^m UT.

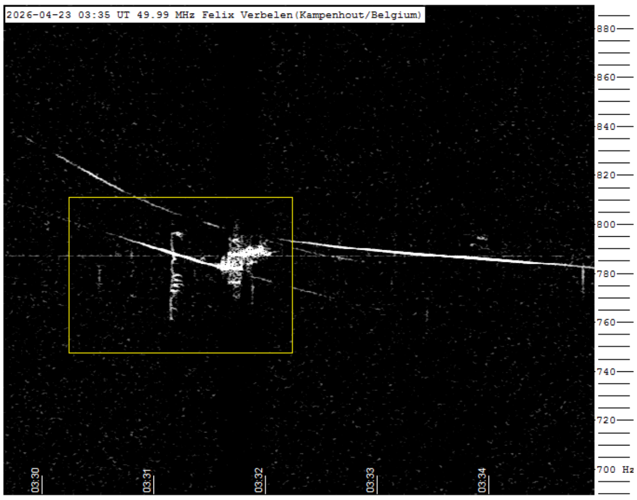

Figure 11 – Meteor echo April 23, 03^{h}35^m UT.

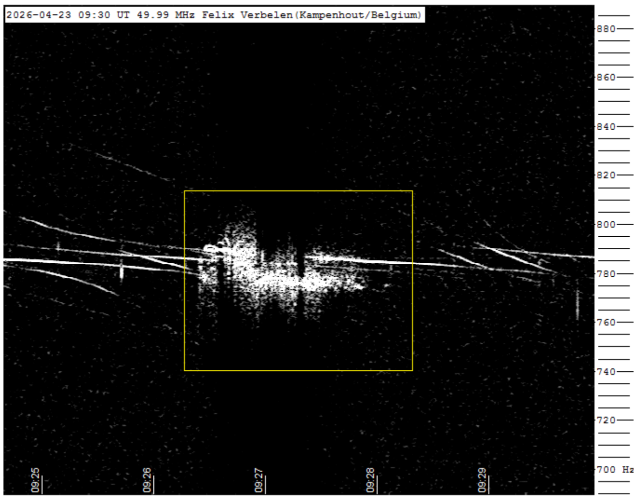

Figure 12 – Meteor echo April 23, 09^{h}30^m UT.

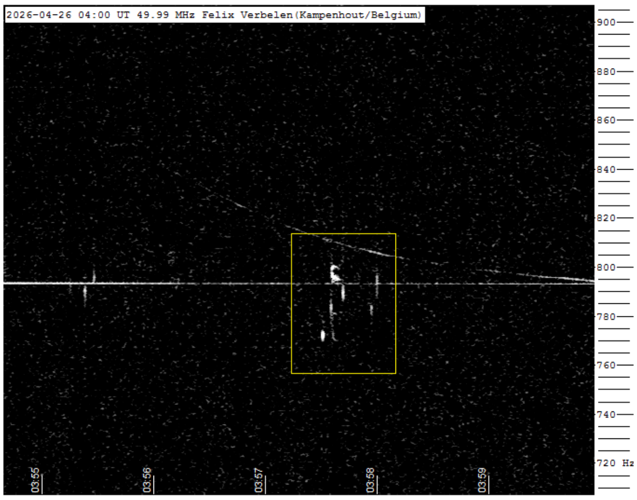

Figure 13 – Meteor echo April 26, 04^{h}00^m UT.

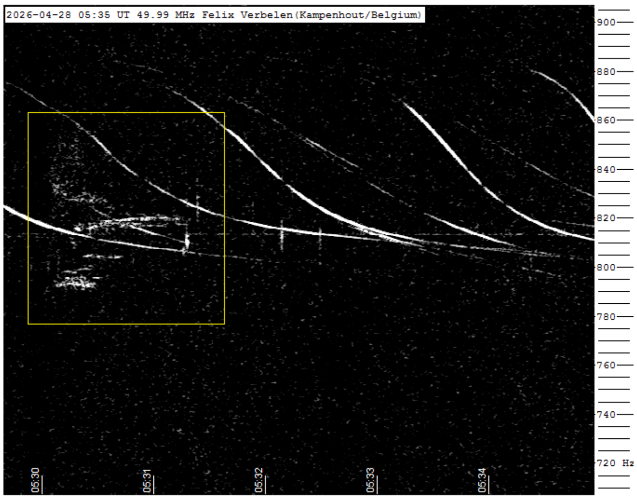

Figure 14 – Meteor echo April 28, 05^{h}35^m UT.

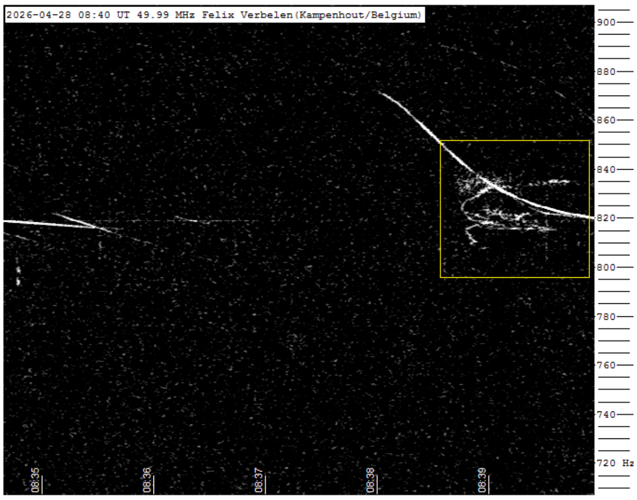

Figure 15 – Meteor echo April 28, 08^{h}40^m UT.

Radio meteors May 2026

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An overview of the radio observations during May is given.

1 Introduction

The graphs show both the daily totals (*Figure 1 and 2*) and the hourly numbers (*Figure 3 and 4*) of "all" reflections counted automatically, and of manually counted "overdense" reflections, overdense reflections longer than 10 seconds and longer than 1 minute, as observed here at Kampenhout (BE) on the frequency of our VVS-beacon (49.99 MHz) during the month of May 2026.

The hourly numbers, for echoes shorter than 1 minute, are weighted averages derived from:

$$N(h) = \frac{n(h-1)}{4} + \frac{n(h)}{2} + \frac{n(h+1)}{4}$$

Local interference and unidentified noise remained very limited, but lightning activity was recorded on 6 days, being intense on May 13 and 30. There were also quite numerous, fairly strong solar flares, mostly type III.

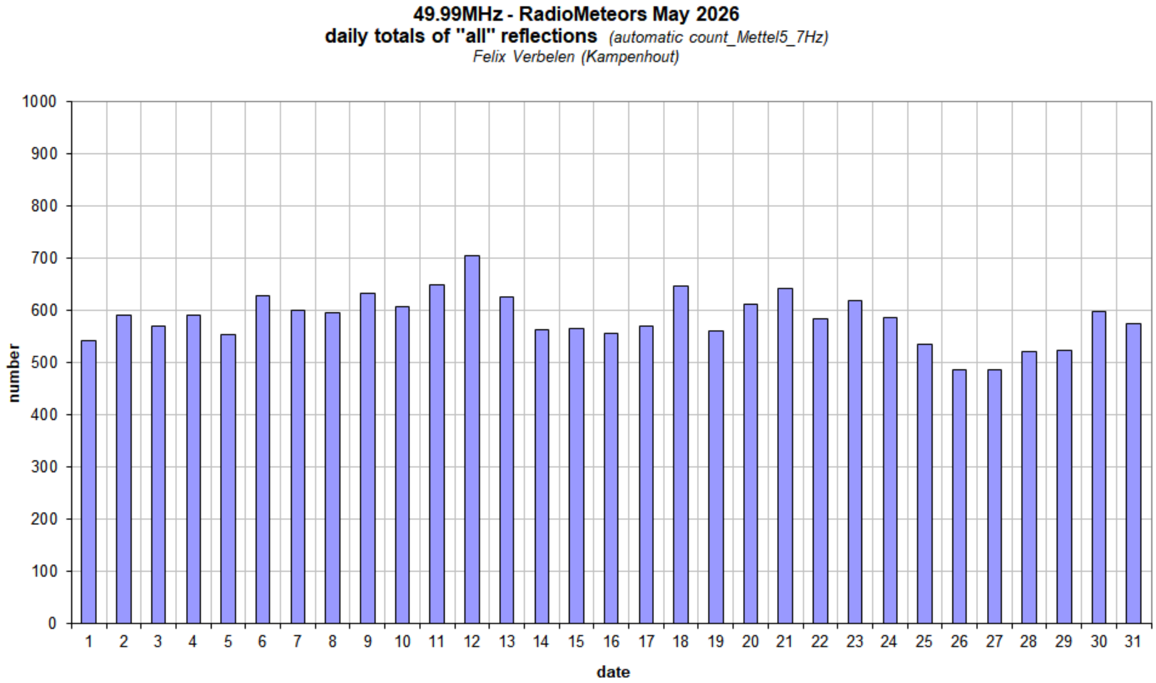
The main highlights of the month were the Eta Aquariids around May 6, though they were less prominent this year than in previous years, especially regarding long-duration reflections. There was also increased activity around May 20, likely caused by the epsilon Aquilids.

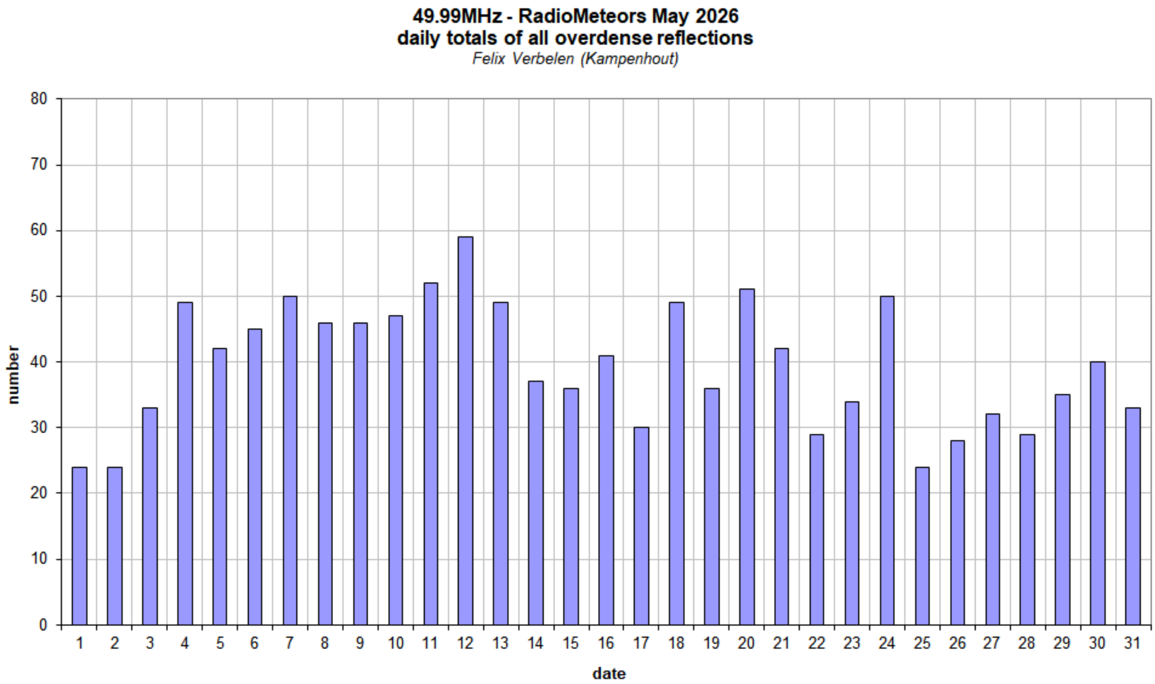
Furthermore, closer analysis of the counts reveals various minor showers.

Over the entire month, 10 reflections lasting longer than 1 minute were observed here. A selection of some notable or strong reflections is shown in *Figures 5 to 25*. Many more are available upon request.

In addition to the usual graphs, you will also find the raw counts in cvs-format[14] from which the graphs are derived. The table contains the following columns: day of the month, hour of the day, day + decimals, solar longitude (epoch J2000), counts of "all" reflections, overdense reflections, reflections longer than 10 seconds and reflections longer than 1 minute, the numbers being the observed reflections of the past hour.

[14] https://www.emeteornews.net/wp-content/uploads/2026/06/202605_49990_FV_rawcounts.csv





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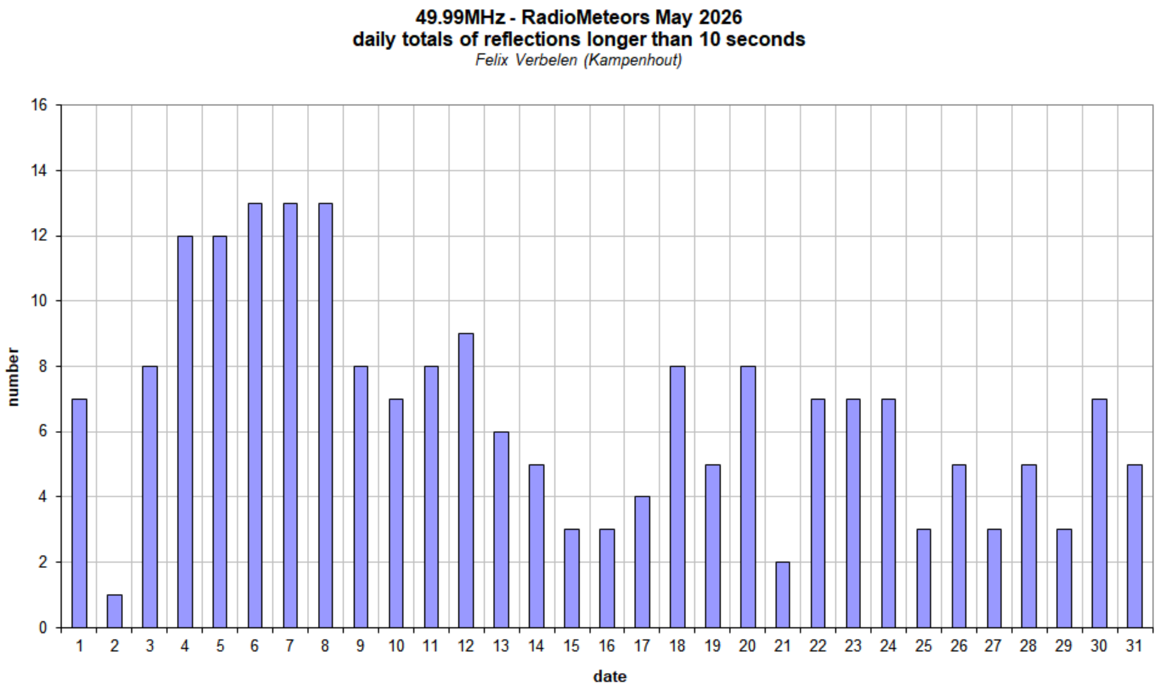


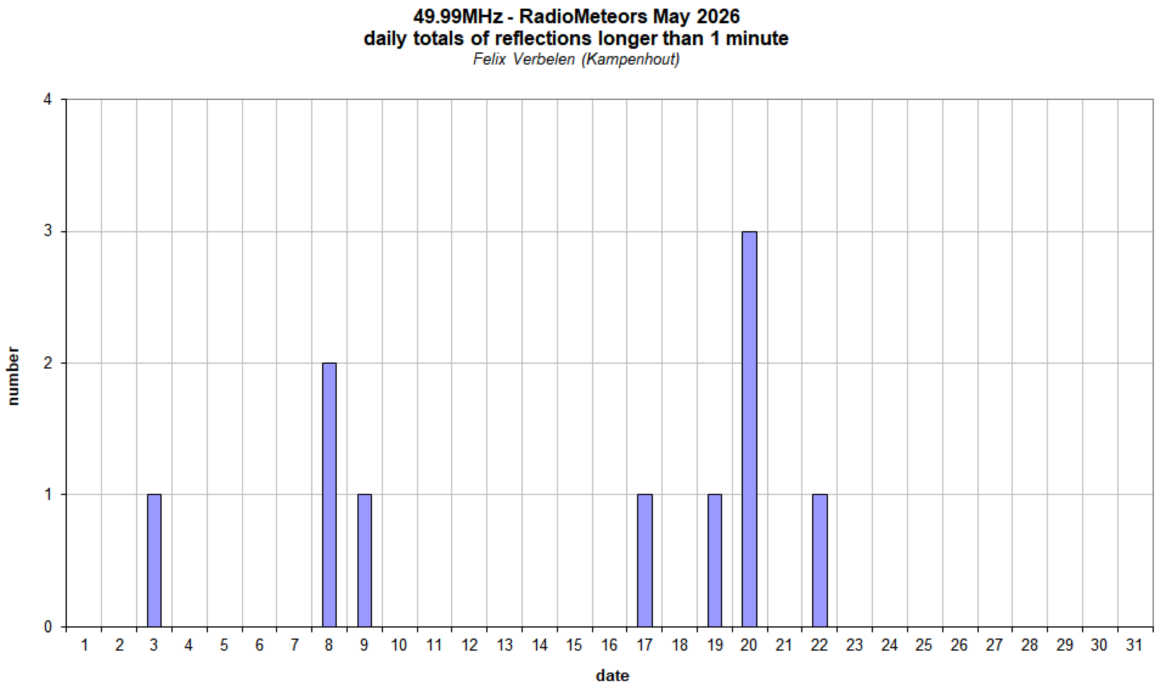
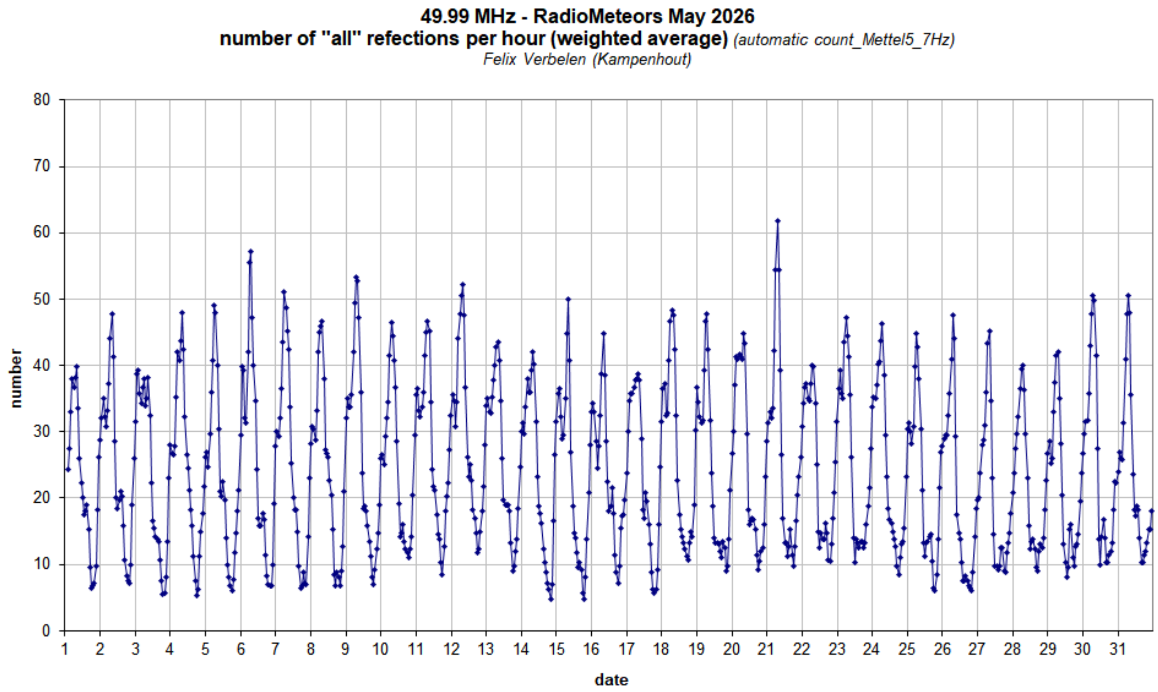


Figure 2 – The daily totals of overdense reflections longer than 10 seconds and longer than 1 minute, as observed here at Kampenhout (BE) on the frequency of our VVS-beacon (49.99 MHz) during May 2026.



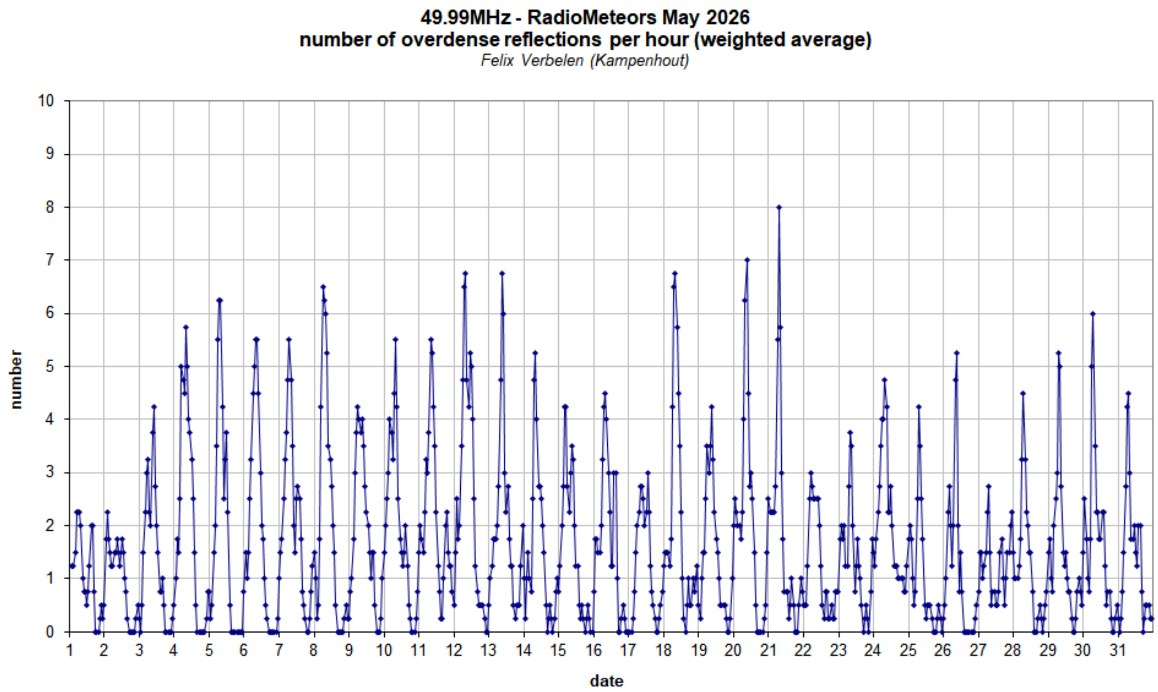
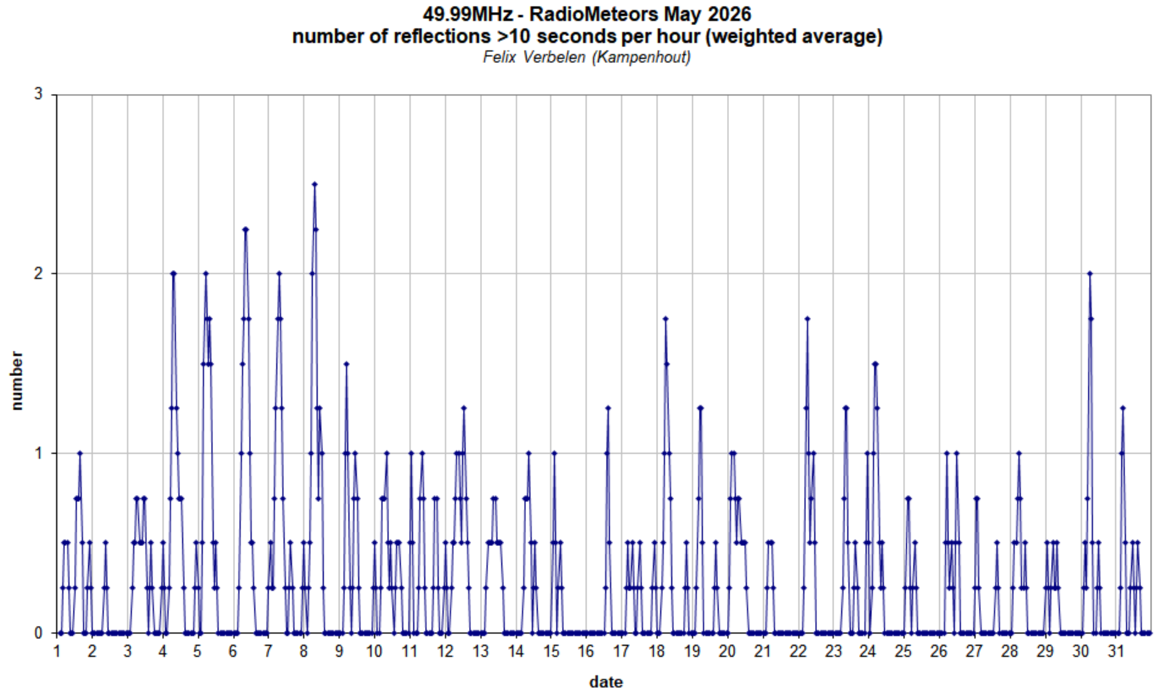
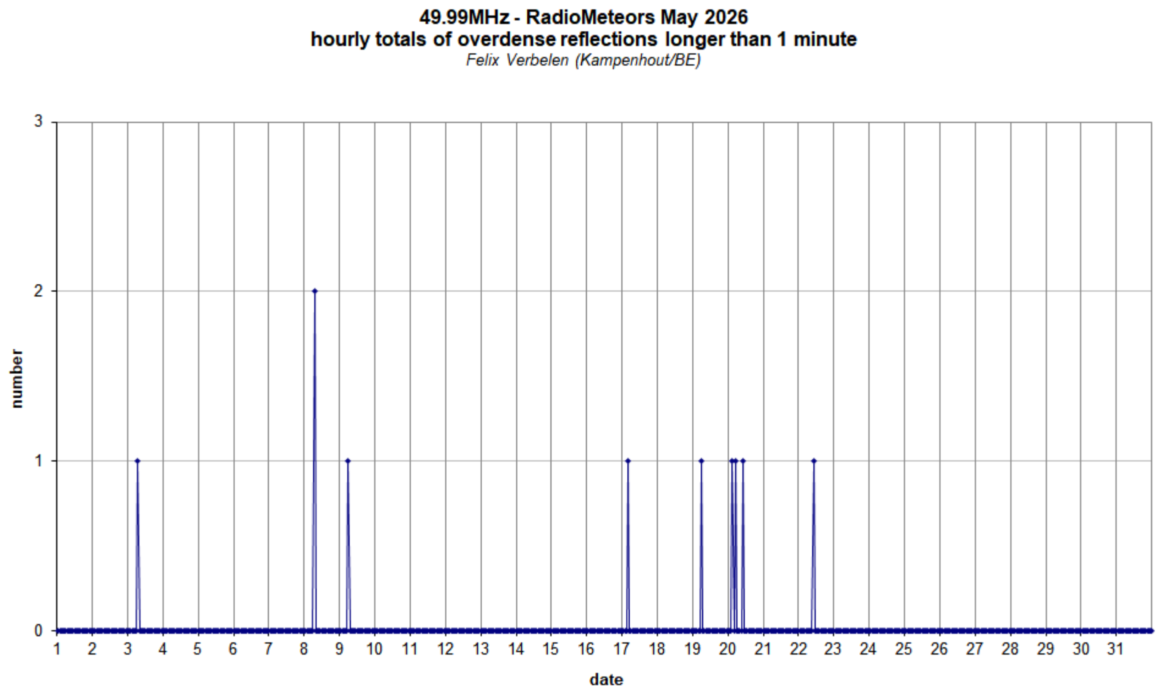


Figure 3 – The hourly numbers of "all" reflections counted automatically, and of manually counted "overdense" reflections, as observed here at Kampenhout (BE) on the frequency of our VVS-beacon (49.99 MHz) during May 2026.





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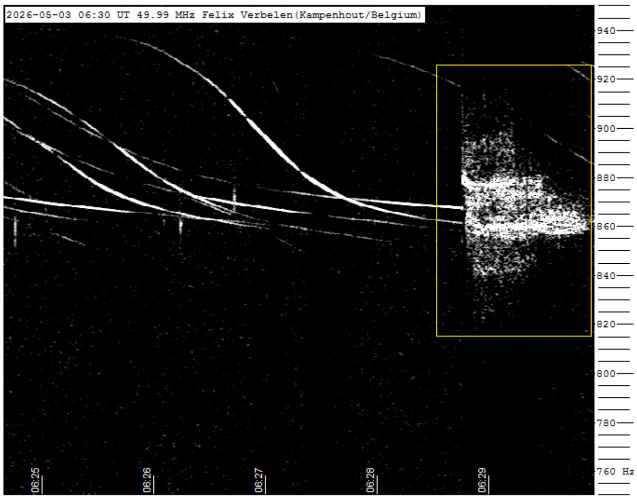

Figure 5 – Meteor echo May 03, 06^{h}30^m UT.

Figure 6 – Meteor echo May 04, 05^{h}10^m UT.

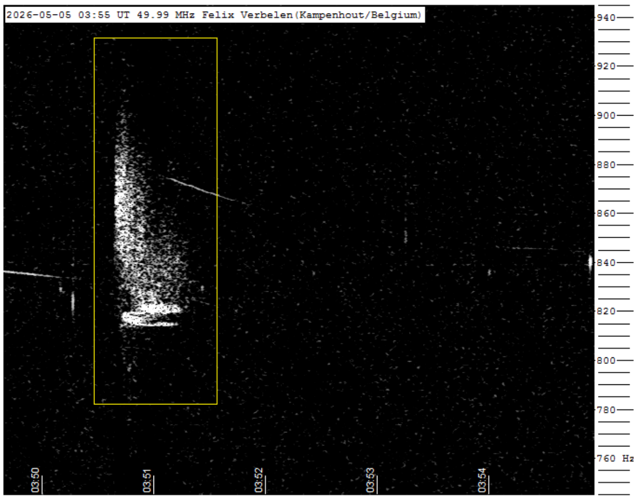

Figure 7 – Meteor echo May 05, 03^{h}55^m UT.

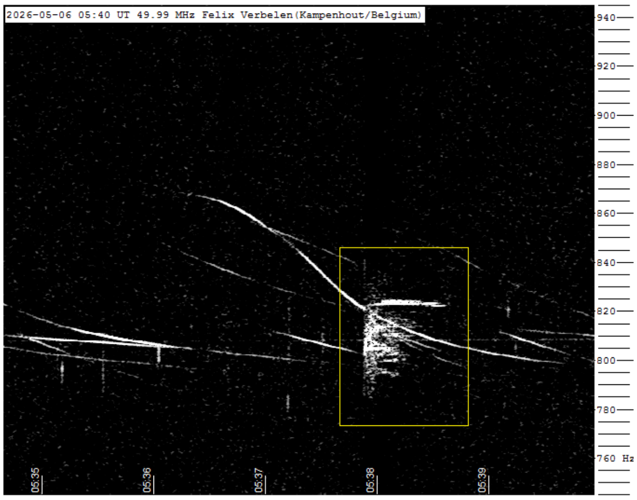

Figure 8 – Meteor echo May 06, 05^{h}40^m UT.

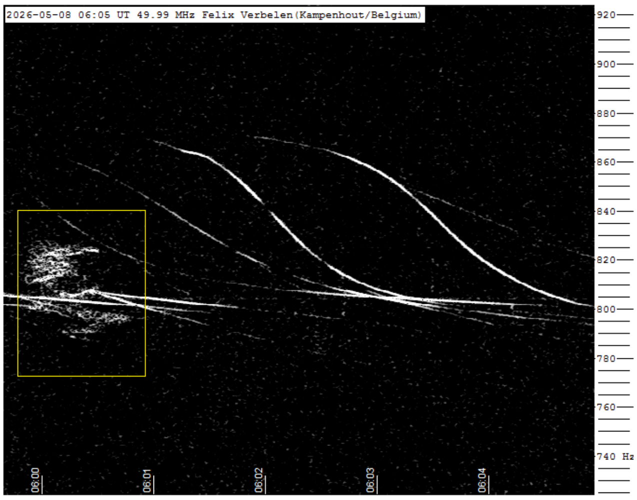

Figure 9 – Meteor echo May 08, 06^{h}05^m UT.

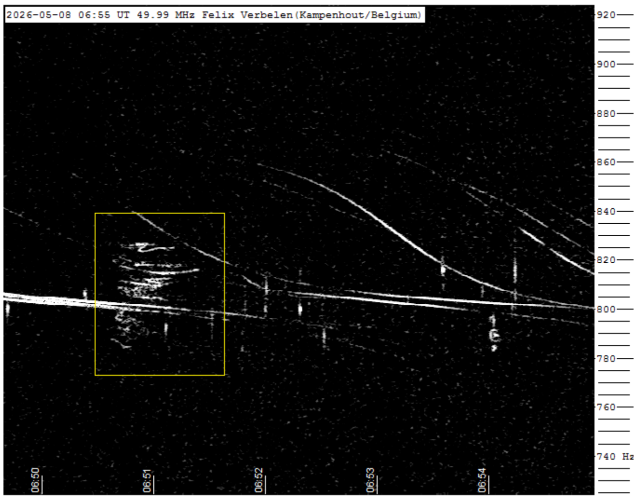

Figure 10 – Meteor echo May 08, 06^{h}55^m UT.

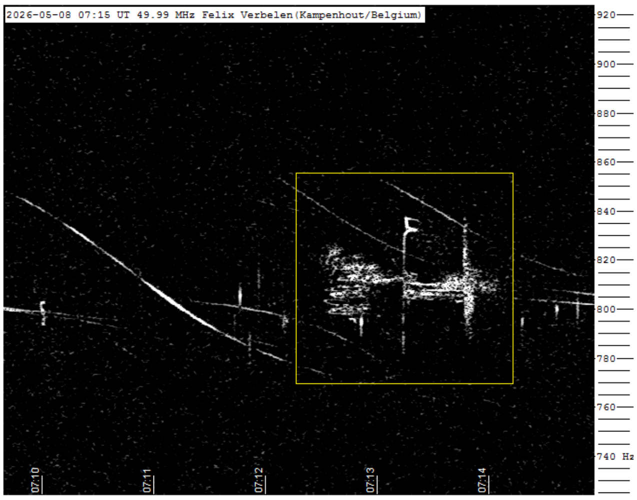

Figure 11 – Meteor echo May 08, 07^{h}15^{m} UT.

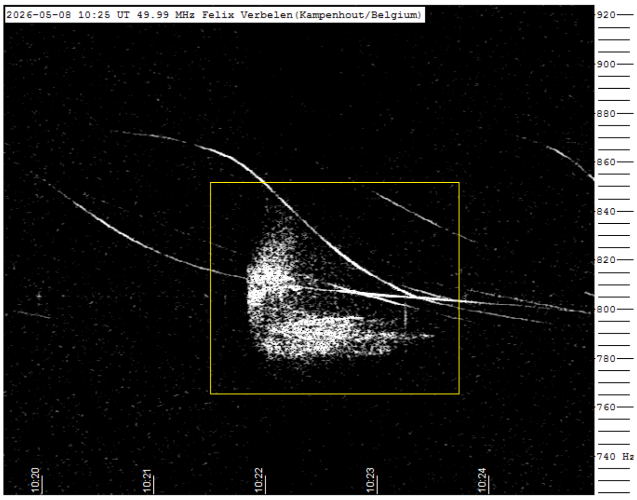

Figure 12 – Meteor echo May 08, 10^{h}25^{m} UT.

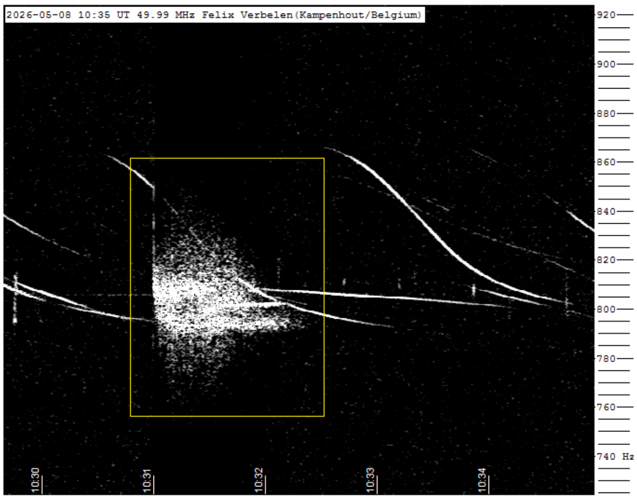

Figure 13 – Meteor echo May 08, 10^{h}35^{m} UT.

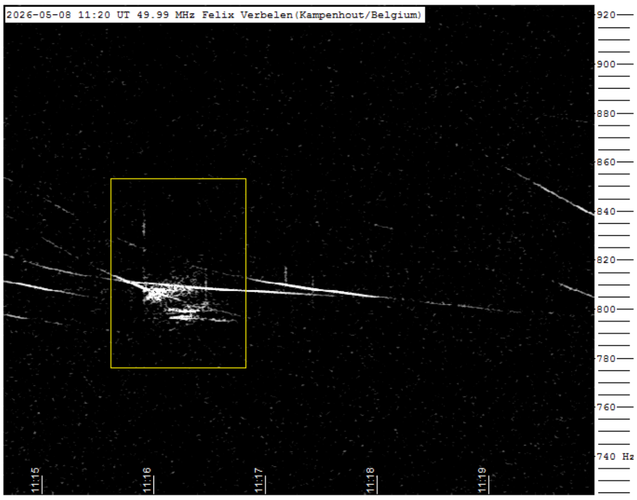

Figure 14 – Meteor echo May 08, 11^{h}20^{m} UT.

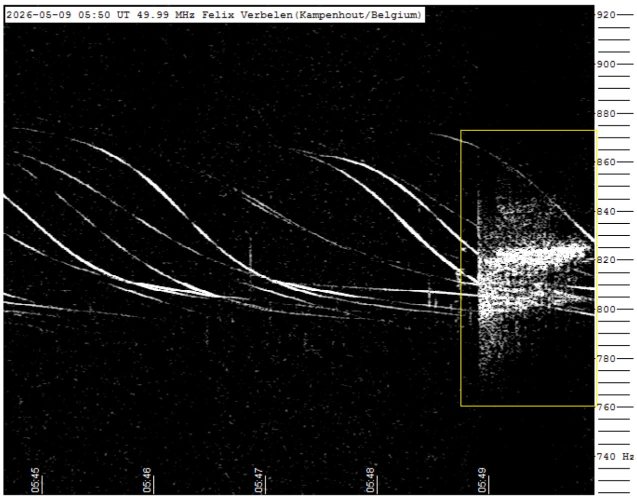

Figure 15 – Meteor echo May 09, 05^{h}50^{m} UT.

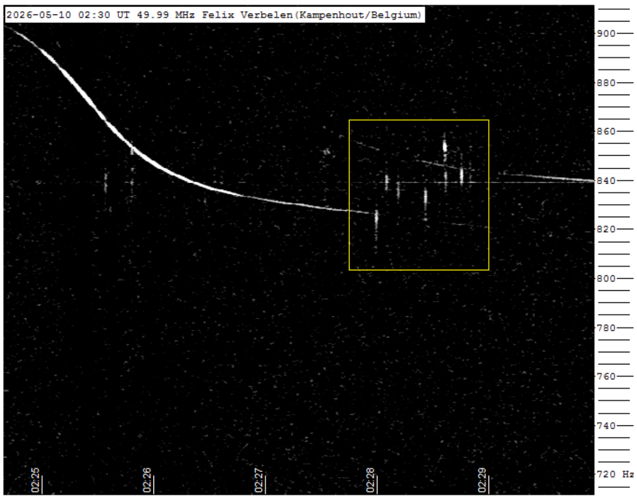

Figure 16 – Meteor echo May 10, 02^{h}30^{m} UT.

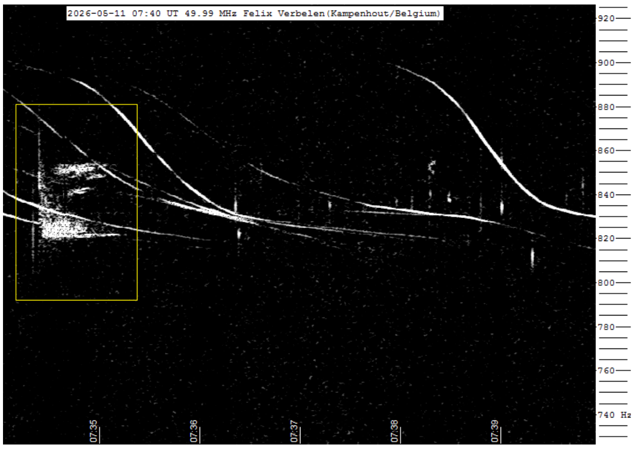

Figure 17 – Meteor echo May 11, 07^{h}40^{m} UT.

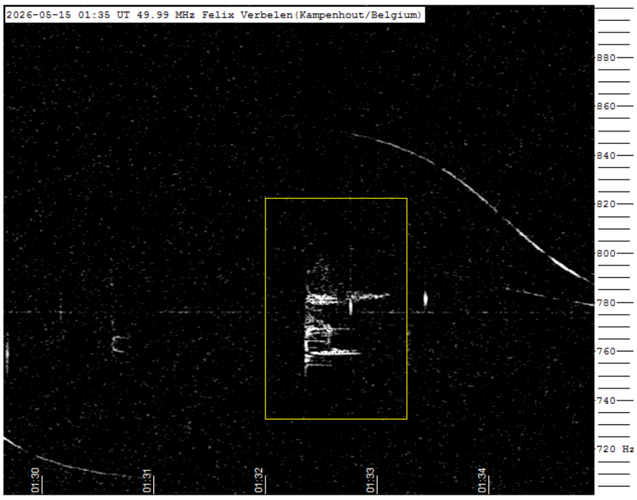

Figure 18 – Meteor echo May 15, 01^{h}35^{m} UT.

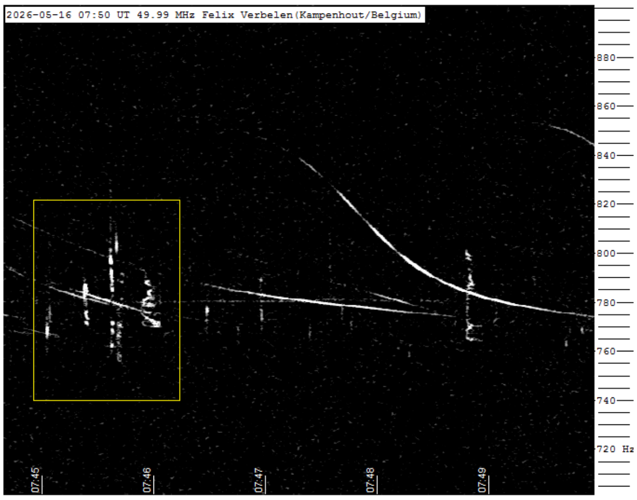

Figure 19 – Meteor echo May 16, 07^{h}50^{m} UT.

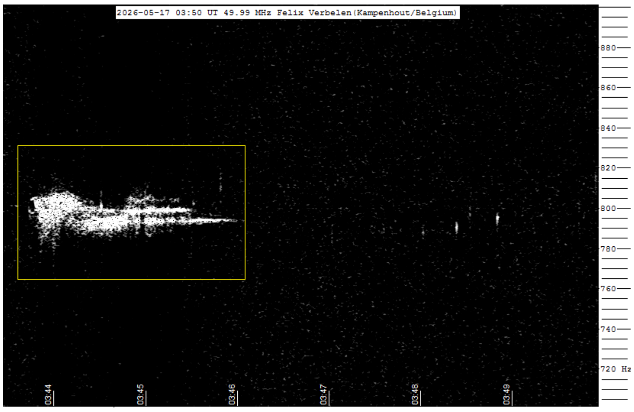

Figure 20 – Meteor echo May 17, 03^{h}50^{m} UT.

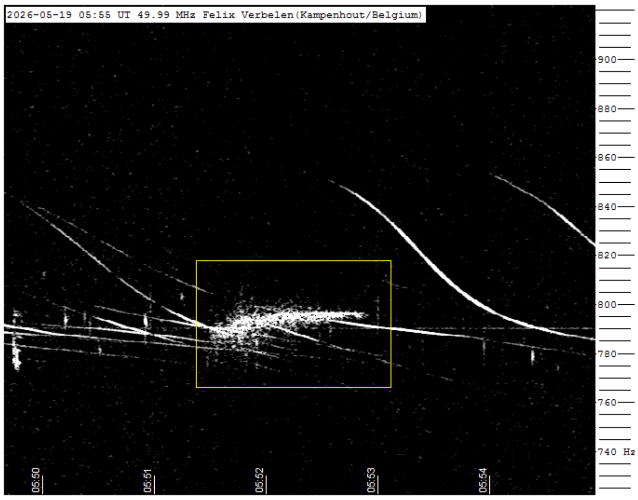

Figure 21 – Meteor echo May 19, 05^{h}55^{m} UT.

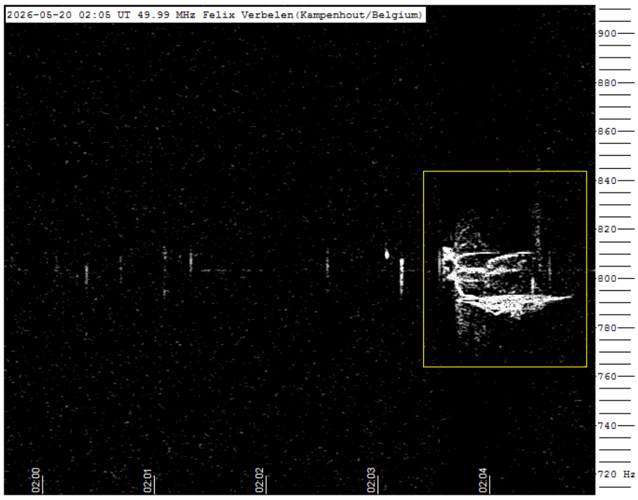

Figure 22 – Meteor echo May 20, 02^{h}05^{m} UT.

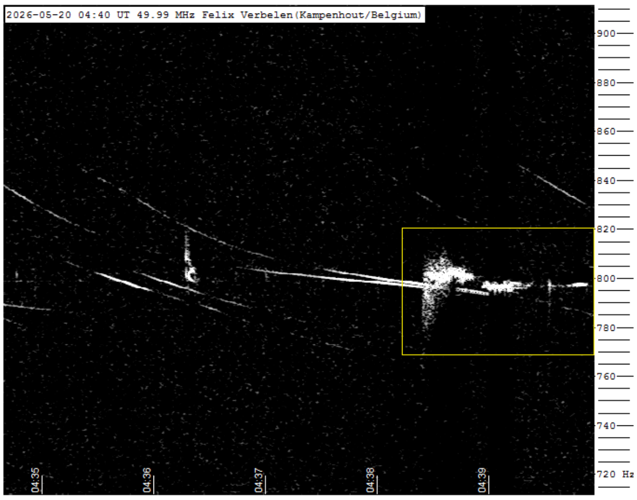

Figure 23 – Meteor echo May 20, 04^{h}40^m UT.

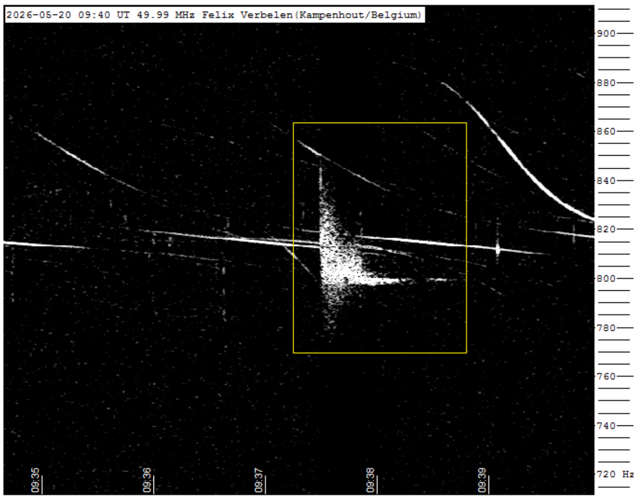

Figure 24 – Meteor echo May 20, 09^{h}40^m UT.

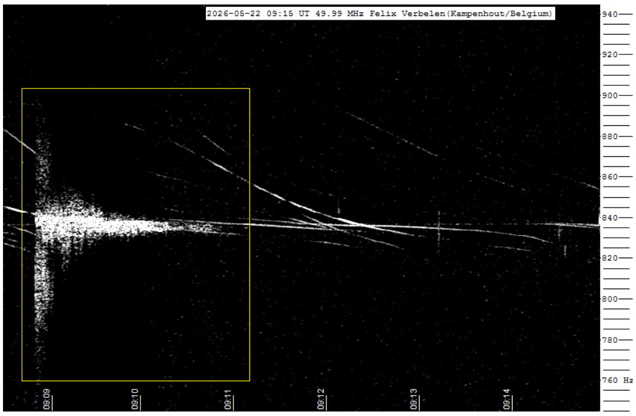

Figure 25 – Meteor echo May 22, 09^{h}15^m UT.

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