# **Radio meteors July 2019**

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An overview of the radio observations during July 2019 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 July 2019.

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

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

During this month the registrations were quite often disturbed by moderate local interferences, on 1 day by weak "sporadic E" (Es) and on 7 days by sometimes strong lightning activity. The automatic countings were manually corrected in order to eliminate as much as possible the effects of these disturbances.

As expected, meteor activity increased in the course of the month, with a significant increase as from 26 July.

Long-lasting reflections were also more numerous. SpecLab pictures of a selection of eye-catching reflections are shown in *Figures 5 to 13*.

If you are interested in the actual figures, please send me an e-mail: felix.verbelen at skynet.be.



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 July 2019.

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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 July 2019.



49.99 MHz - RadioMeteors July 2019 number of "all" refections per hour (weighted average) (automatic count\_Mettel5\_7Hz) Felix Verbelen (Kampenhout)

*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 July 2019.

16 17

date

18 19 20 21

22 23 24

25 26 27

30 31

28 29

13 14 15

10

11 12

0

1

2 3 4

5 6 7 8 9



49.99MHz - RadioMeteors July 2019 hourly totals of overdense reflections longer than 1 minute Felix Verbelen (Kampenhout/BE)



*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 July 2019.



Figure 3 - 8 July 2019  $03^{h}40^{m}$  UT.



Figure 6 – 15 July 2019  $18^{\rm h}40^{\rm m}$  UT.



Figure 4 - 10 July 2019  $05^{h}20^{m}$  UT.



Figure 7-16 July 2019  $04^{\rm h}35^{\rm m}$  UT.



*Figure* 5 – 10 July 2019 06<sup>h</sup>10<sup>m</sup> UT.



Figure 8-17 July 2019  $01^{\rm h}50^{\rm m}$  UT.



Figure 9 – 17 July 2019 $07^{\rm h}25^{\rm m}$  UT.



Figure 10 - 22 July 2019  $05^{h}10^{m}$  UT.



*Figure 12* – 28 July 2019 07<sup>h</sup>40<sup>m</sup> UT.



*Figure 13* – 28 July 2019 13<sup>h</sup>00<sup>m</sup> UT.



*Figure 11* – 22 July 2019 08<sup>h</sup>35<sup>m</sup> UT.

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

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

During this month the registrations were quite often disturbed by moderate local interferences, on 3 days by weak "sporadic E" (Es) and on 5 days by sometimes strong lightning activity.

The automatic countings were manually corrected in order to eliminate as much as possible the effects of these disturbances. The Perseids were of course the main meteor shower of the month, showing many radio reflections lasting longer than 10 seconds on both the 13<sup>th</sup> and 14<sup>th</sup>. Surprisingly, reflections lasting longer than 1 minute were observed mainly on August 13<sup>th</sup> but were far less numerous on August 14<sup>th</sup>.

As in previous years, the general meteor activity was important the days before the main peaks of 13<sup>th</sup> and 14<sup>th</sup> August, and sharply decreased thereafter.

The eye-catcher of the month was a more than 3 minutes reflection on August  $13^{\text{th}}$ , starting at  $23^{\text{h}}31^{\text{m}}$  UT (*Figure 12*).

SpecLab pictures of this and of a small selection of other eye-catching reflections are displayed in *Figures 3–14*.

If you are interested in the actual figures, please send me an e-mail: felix.verbelen at skynet.be.



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 August 2019.



*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 August 2019.

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*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 August 2019.

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49.99MHz - RadioMeteors August 2019 number of reflections >10 seconds per hour (weighted average) Felix Verbelen (Kampenhout)

49.99MHz - RadioMeteors August 2019 hourly totals of overdense reflections longer than 1 minute Felix Verbelen (Kampenhout/BE)



*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 August 2019.



Figure 3 - 2019 August 4 at  $3^h 35^m$  UT.



Figure 4 - 2019 August 7 at  $4^{h}20^{m}$  UT.



Figure 6 - 2019 August 13 at  $03^{h}35^{m}$  UT.



Figure 7 – 2019 August 13 at  $4^{h}35^{m}$  UT.



*Figure* 5 – 2019 August 11 at 22<sup>h</sup>55<sup>m</sup> UT.



Figure 8 - 2019 August 13 at  $05^{h}05^{m}$  UT.



Figure 9 – 2019 August 13 at  $08^{h}35^{m}$  UT.



*Figure 10* – 2019 August 13 at 09<sup>h</sup>05<sup>m</sup> UT.



Figure 11 - 2019 August 13 at  $21^{h}55^{m}$  UT.



Figure 12 - 2019 August 13 at  $23^{h}35^{m}$  UT.



*Figure 13* – 2019 August 14 at 02<sup>h</sup>00<sup>m</sup> UT.



Figure 14 - 2019 August 24 at  $05^{h}50^{m}$  UT.