The background of the slide is a composite image. The upper portion shows a dark night sky filled with numerous stars and several bright, white streaks representing meteor trails. The lower portion shows a dark landscape with a calm body of water in the foreground, reflecting the light from the sky. A large, leafy tree is visible on the right side of the landscape. The overall scene is a serene night view of a natural setting.

# The Radio Meteor Zoo: searching for meteors in BRAMS radio observations

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(2) Royal Observatory of Belgium

# The Radio Meteor Zoo

The screenshot shows the website's navigation bar with links for PROJECTS, ABOUT, GET INVOLVED, TALK, BUILD A PROJECT, NEWS, NOTIFICATIONS, MESSAGES, and HERVÉ LAMY. Below the navigation is a sub-menu for RADIO METEOR ZOO with links for ABOUT, CLASSIFY, TALK, COLLECT, PROJECT WEBSITE, and RESULTS. A blue notification box contains an update about the Perseids 2017 and a thank you message. The main content area features a background image of a tree at night and the text 'Help us identify meteors in radio data' with 'Learn more' and 'Get started' buttons. At the bottom, there are three panels of radio meteor data plots and a social media widget showing '3 people are talking about Radio Meteor Zoo right now.' with a 'Join in' button.

PROJECTS ABOUT GET INVOLVED TALK BUILD A PROJECT NEWS NOTIFICATIONS MESSAGES HERVÉ LAMY

RADIO METEOR ZOO ABOUT CLASSIFY TALK COLLECT PROJECT WEBSITE RESULTS

UPDATE : Preliminary results of the Perseids 2017 are available in the [Results](#) section.  
Now we would like to compare the activity observed by the receiving station in Humain with two other stations, based in Ottignies and Overpelt. So keep hunting for meteors on the Radio Meteor Zoo!  
For new users please visit the [FAQ](#) and the recently added Field Guide if you need help to analyze images.  
Thank you for your constant support!

Help us identify meteors in radio data

[Learn more](#) [Get started](#)

3 people are talking about **Radio Meteor Zoo** right now.

[Join in](#)

# Task for the citizen scientists

Draw a rectangle around each potential meteor echo.

rectangle tool 12 drawn

Need some help with this task?

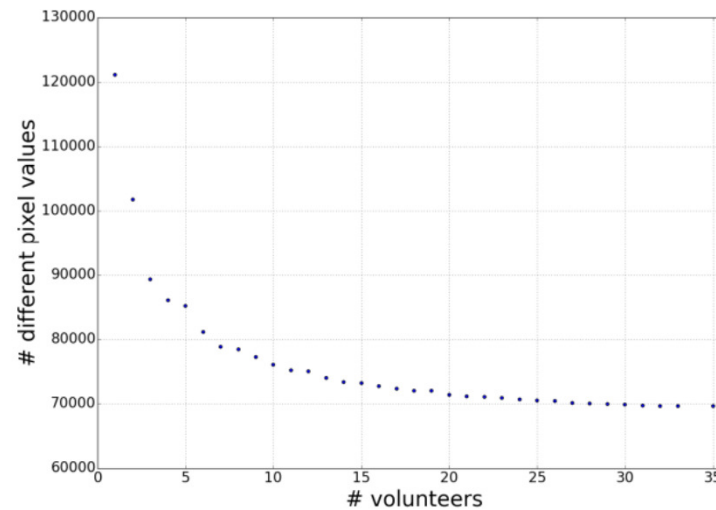
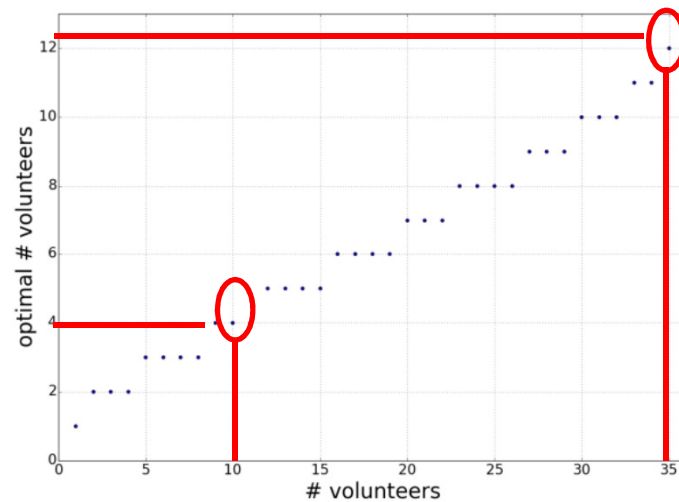
Done & Talk Done ⚙️

Show the project tutorial

FIELD GUIDE

# Optimal number of users

- Small scale test with 35 users and 12 spectrograms
- Comparison of « meteor pixels » in the reference spectrograms (counted by us) and counted by at least  $k$  users  $\rightarrow D(k)$  for  $k=1\dots35$
- $D(k)$  is minimum for  $k_{\text{opt}}=12$  when each spectrogram is counted by 35 users
- In practice we need less people counting so searching for when the number of users = 1, 2, ..., 35



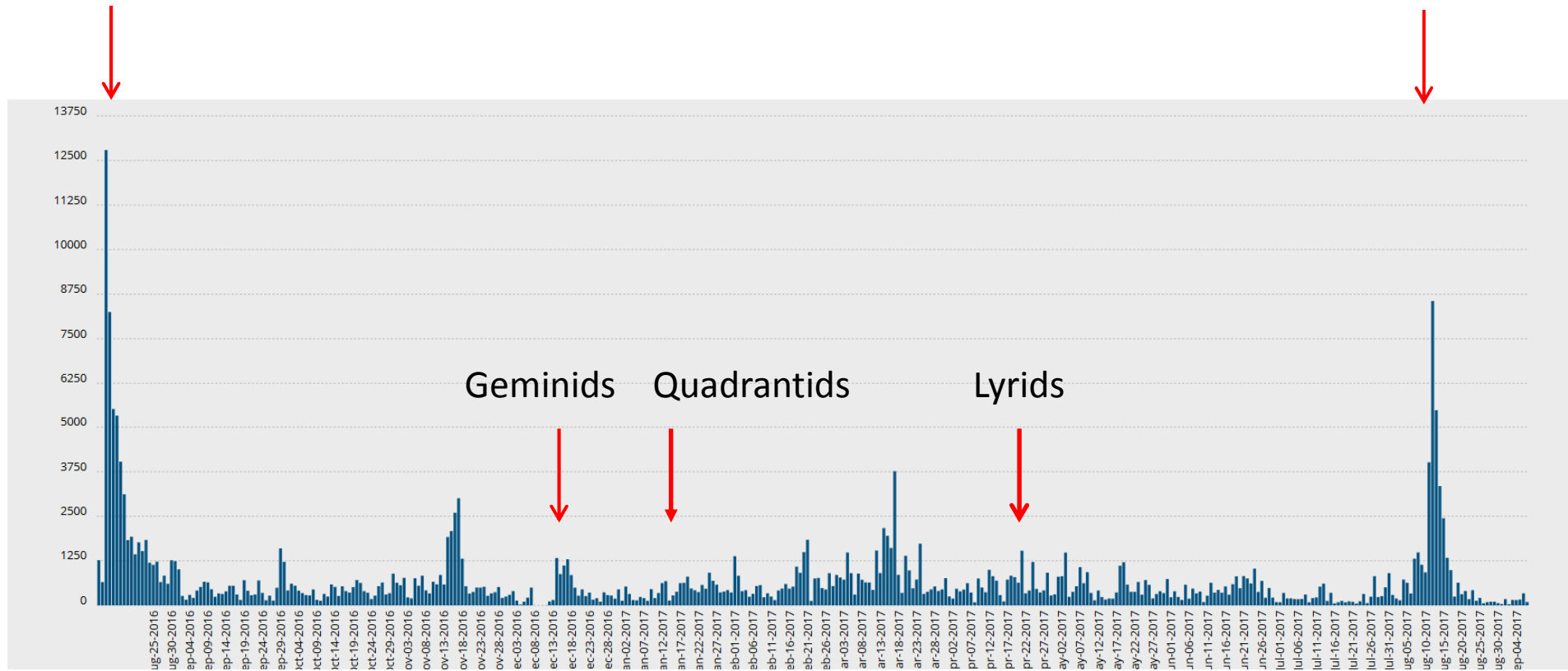
# Statistics on 07/09/2017

- Number of uploaded images : 29 006 (~ 100 days of data)
- Number of retired images : 28 838
- Number of registered users : 5235
- Total number of classifications : 309 106
- Meteor showers analyzed so far :
  - Perseids 2016 : 6 stations, 7 days
  - Geminids 2016 : 5 stations, 6 days
  - Quadrantids 2017 : 2 stations, 5 days
  - Lyrids 2017 : 1 station, 5 days
  - Perseids 2017 : 3 stations, 5 days (on-going)

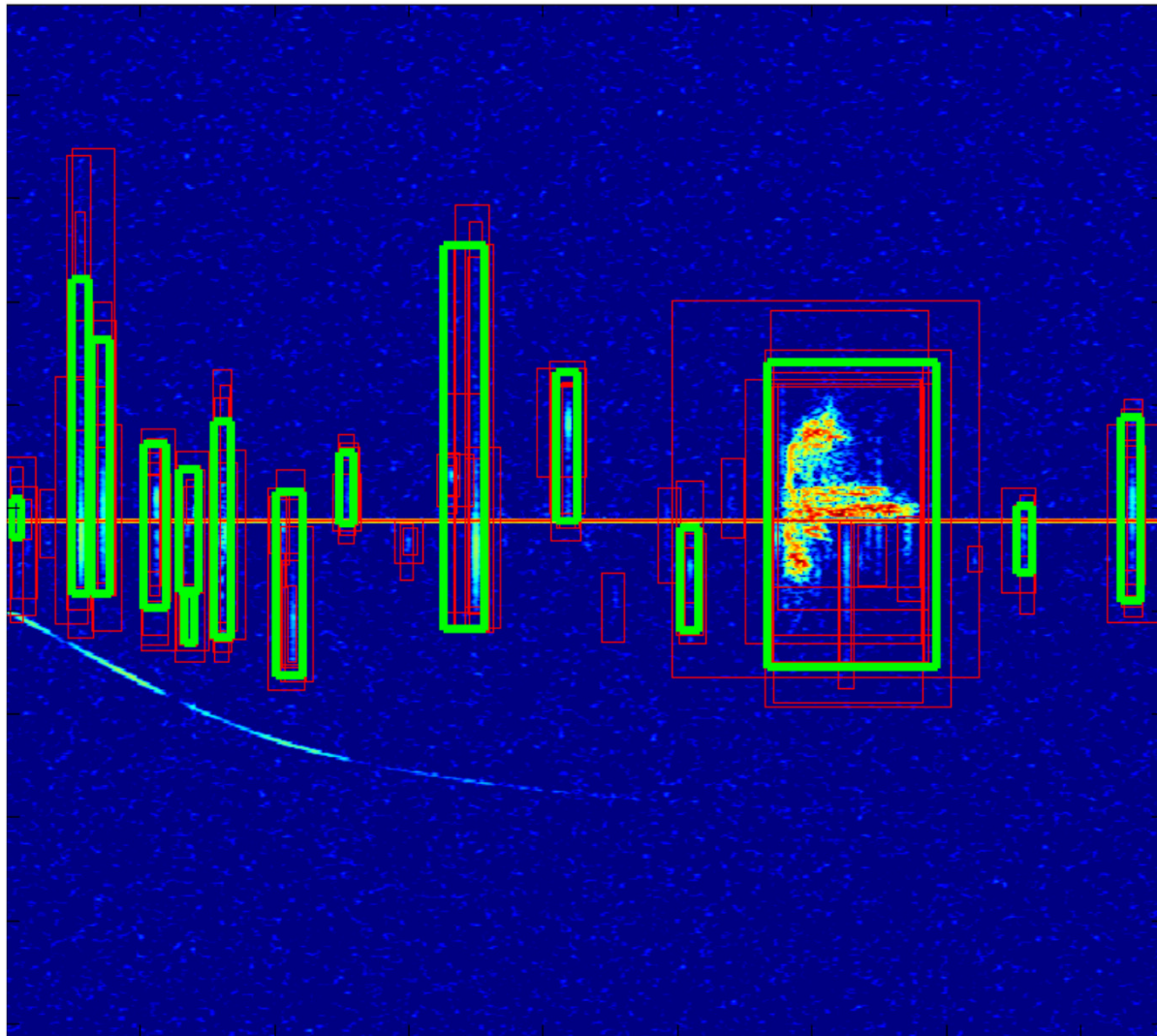
# Statistics of one year

Perseids

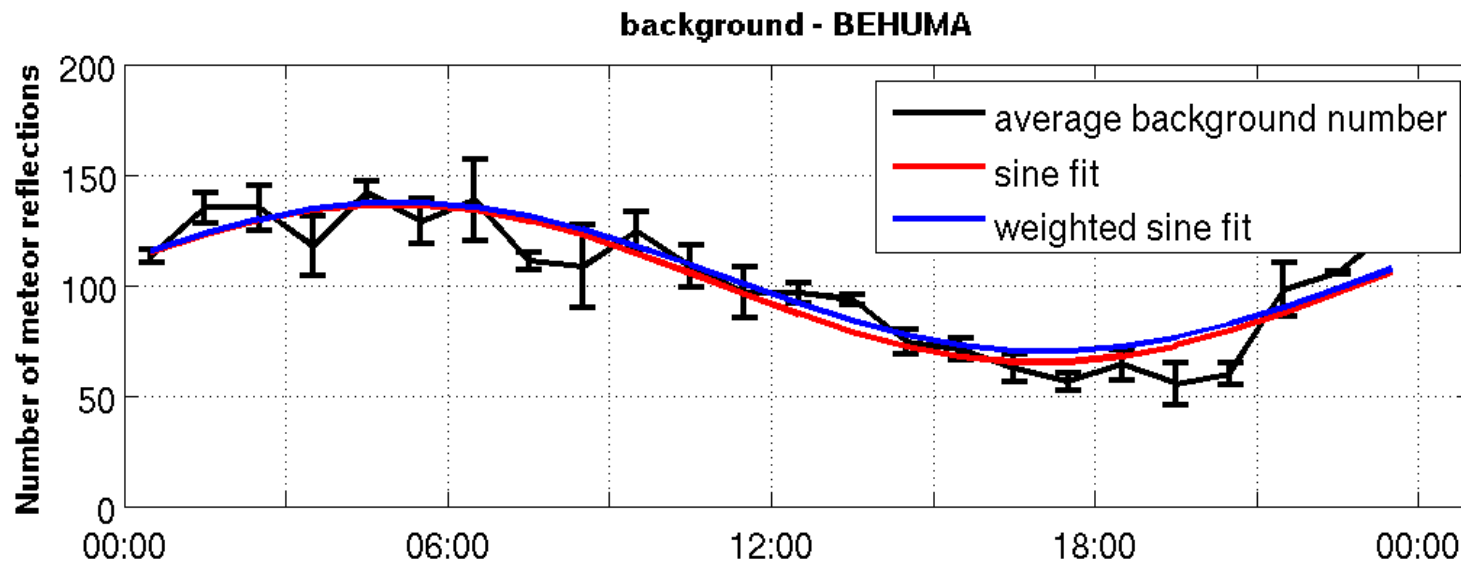
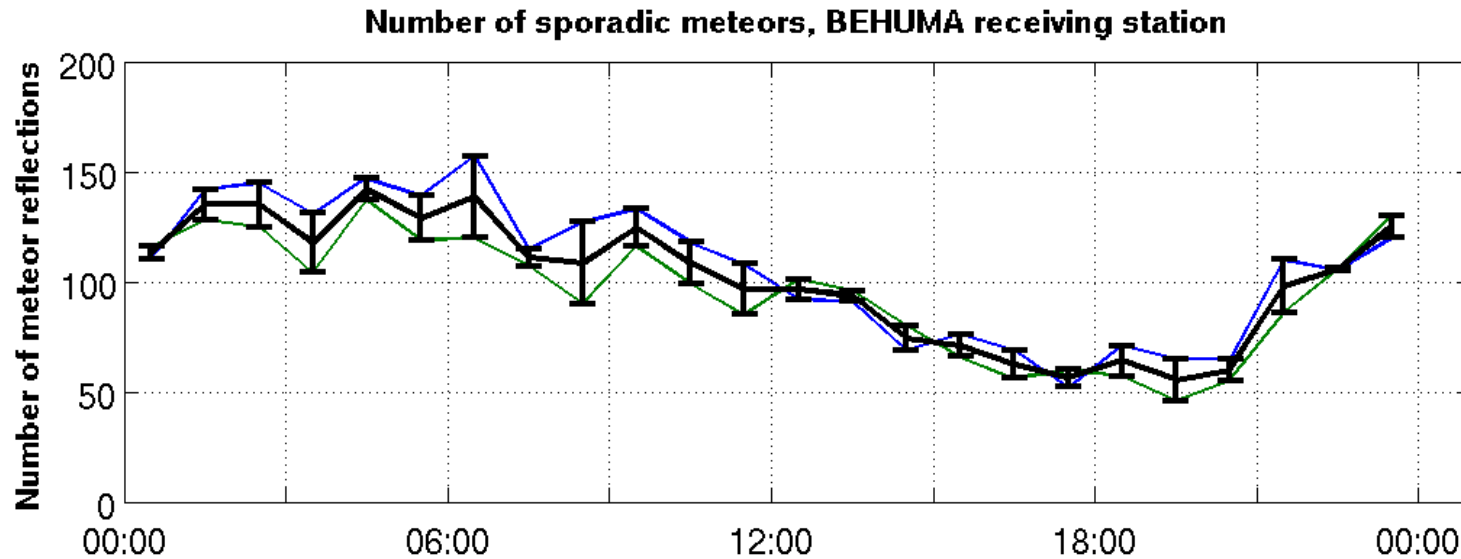
Perseids



# Results : aggregation method



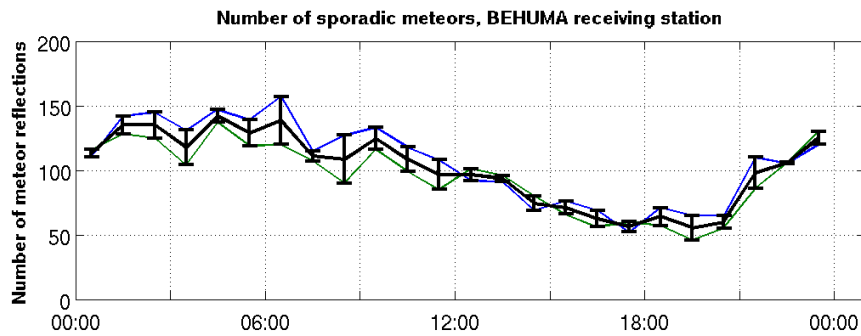
# Perseids 2016, Humain: sporadic background



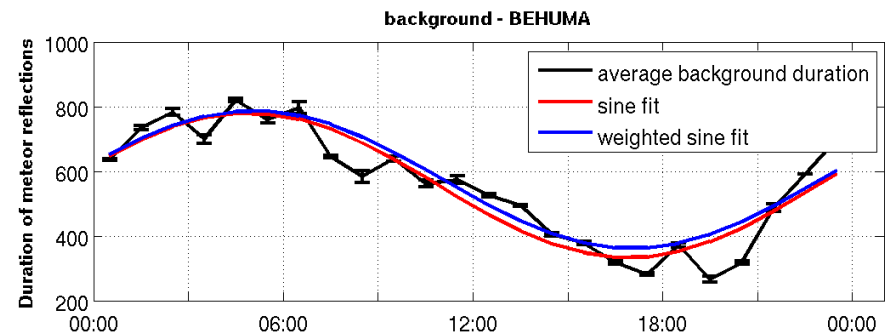
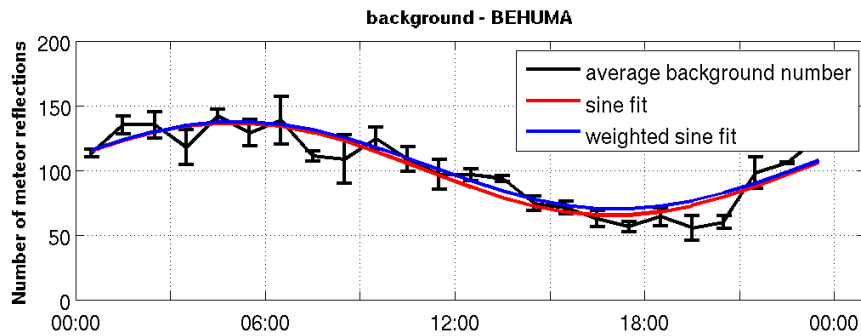
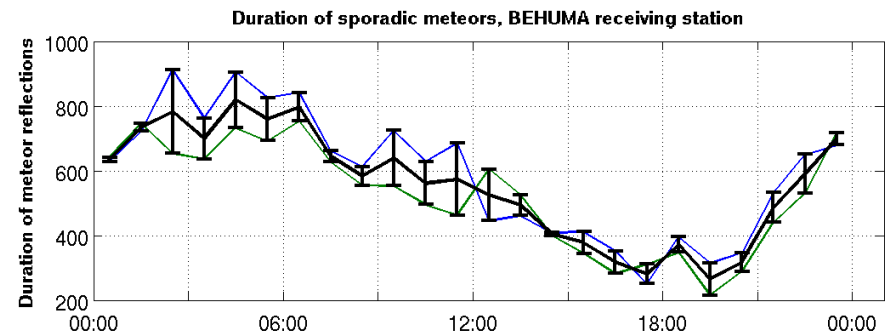


# Perseids 2016, Humain: sporadic background

Number of meteor reflections

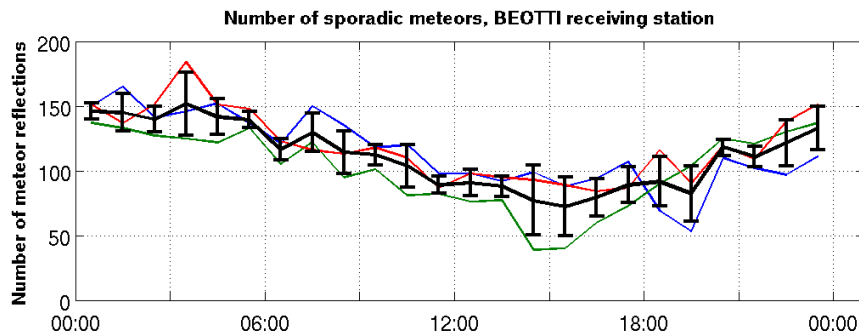


Total duration of meteor reflections

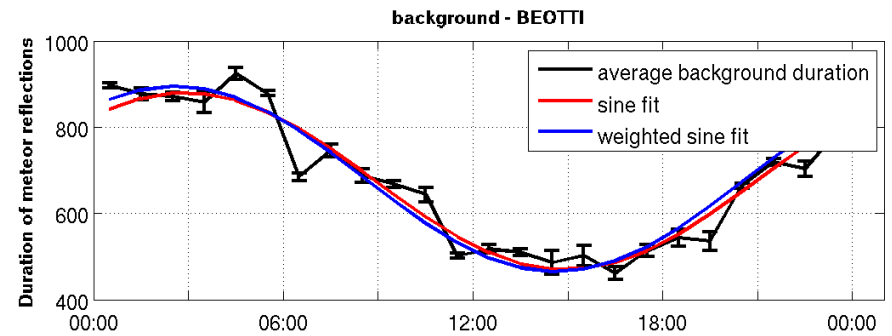
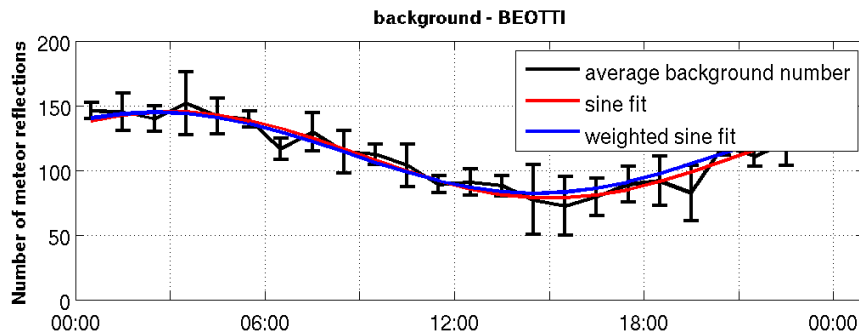
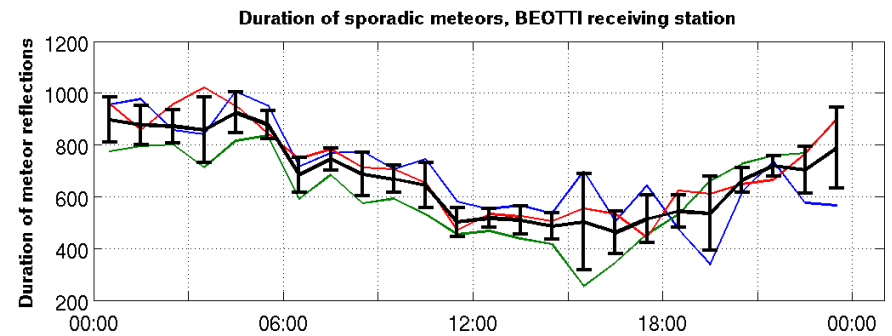


# Perseids 2016, Ottignies: sporadic background

Number of meteor reflections

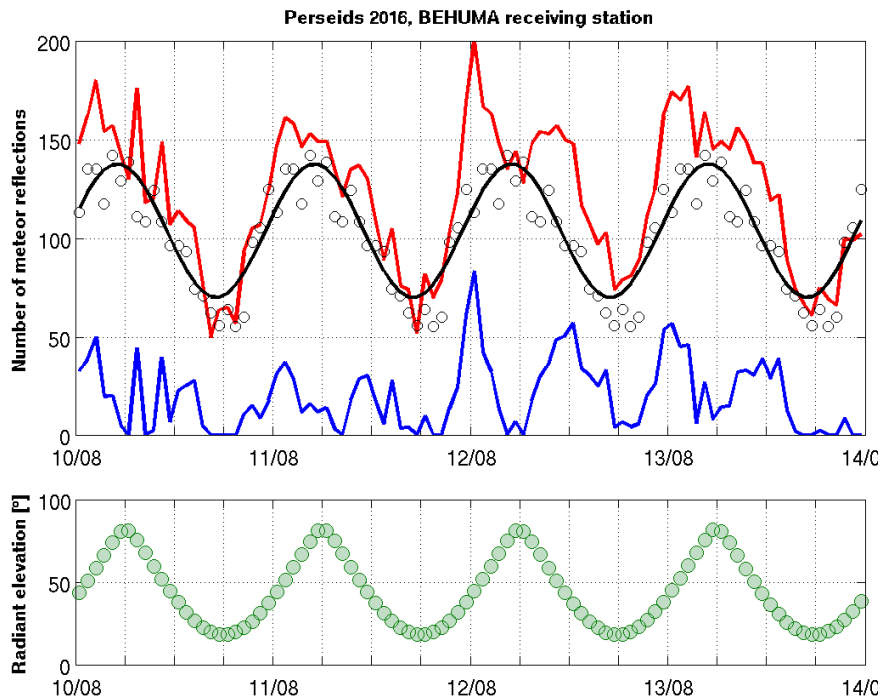


Total duration of meteor reflections

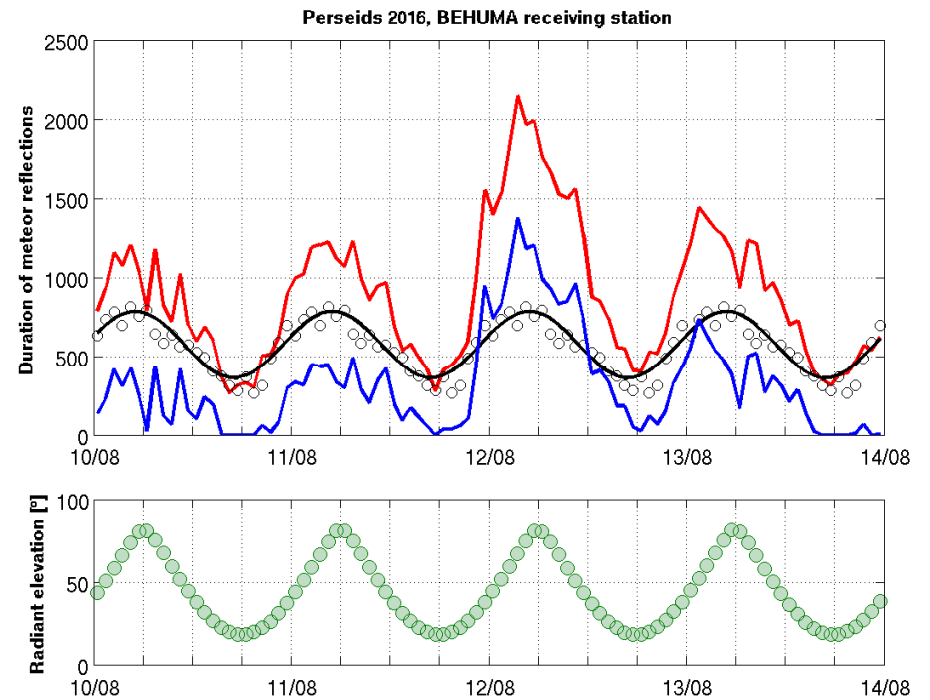


# Perseids 2016, Humain

Number of meteor reflections

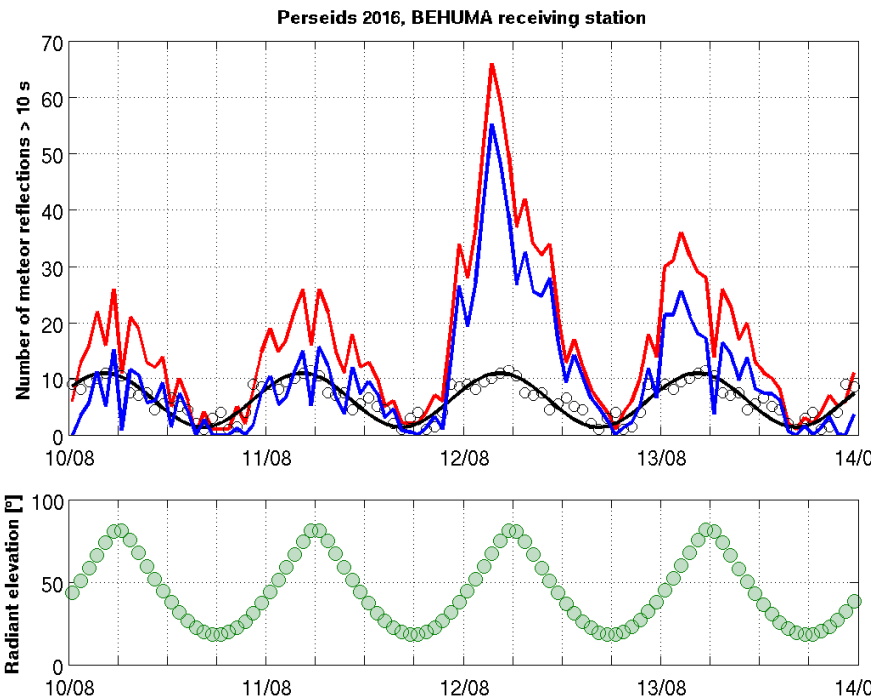


Total duration of meteor reflections

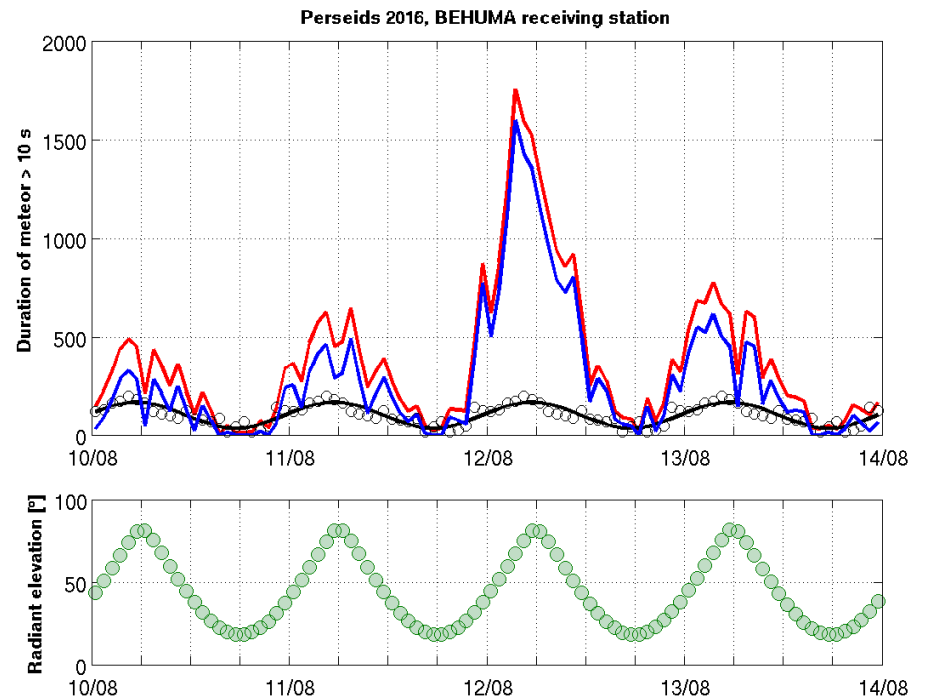


# Perseids 2016, Humain

Number of meteor reflections > 10 s

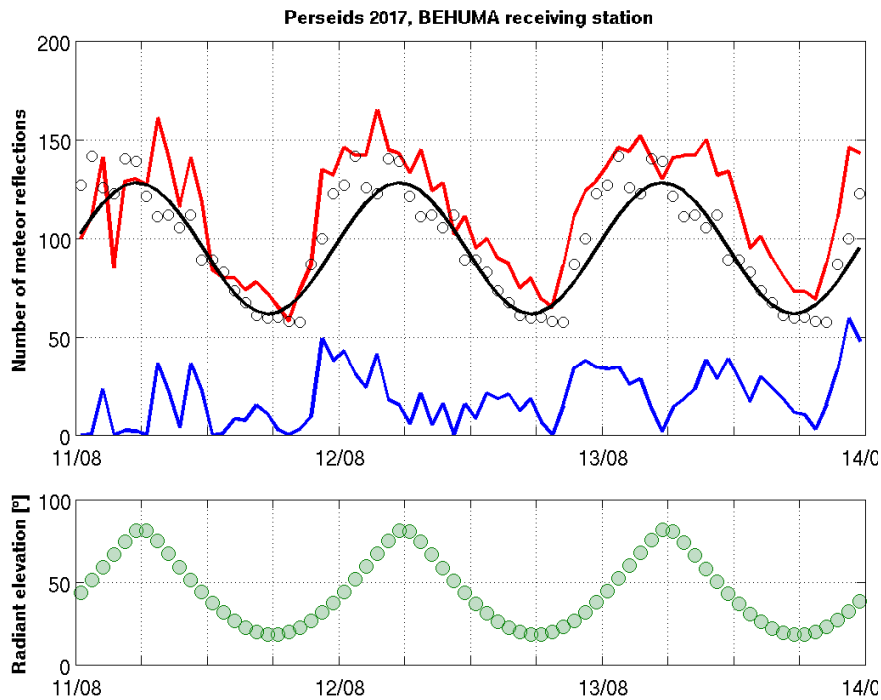


Total duration of meteor reflections > 10 s

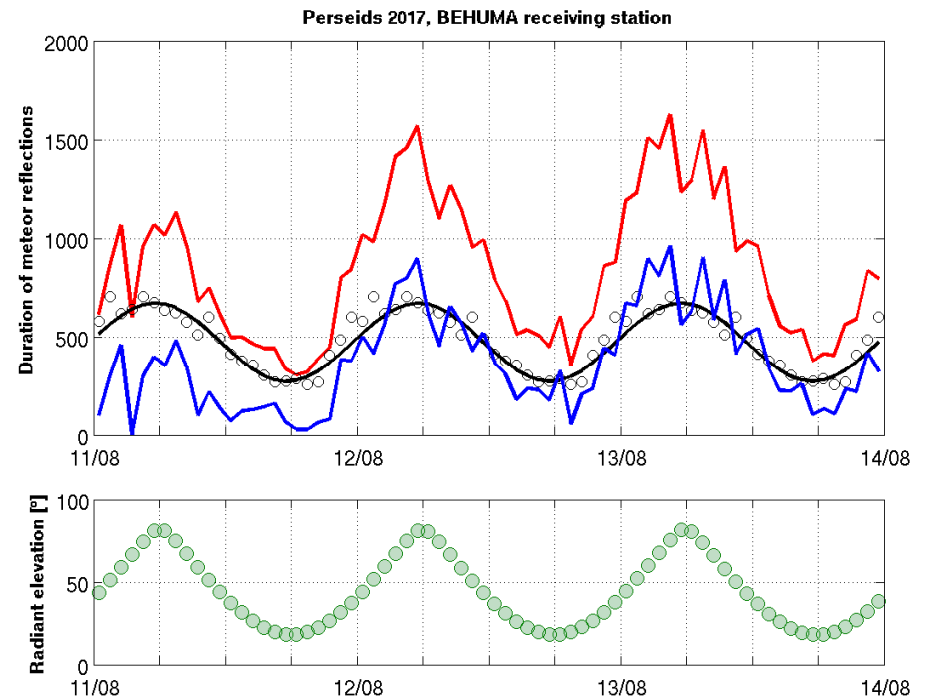


# Perseids 2017, Humain

Number of meteor reflections

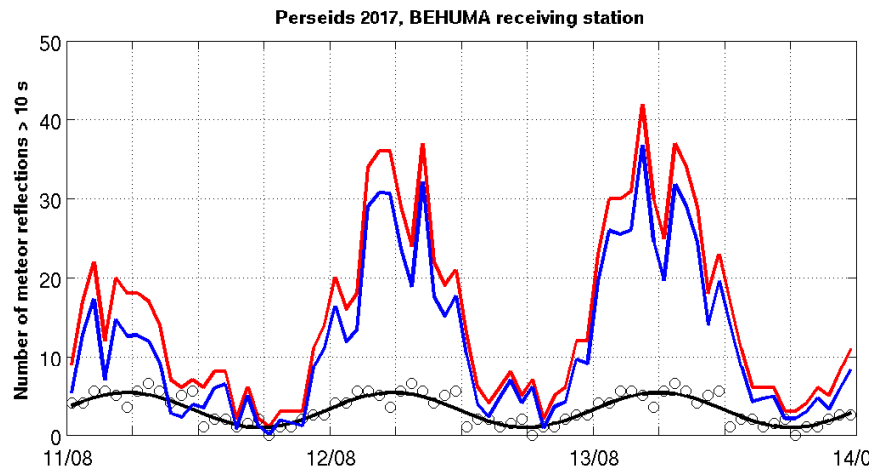


Total duration of meteor reflections

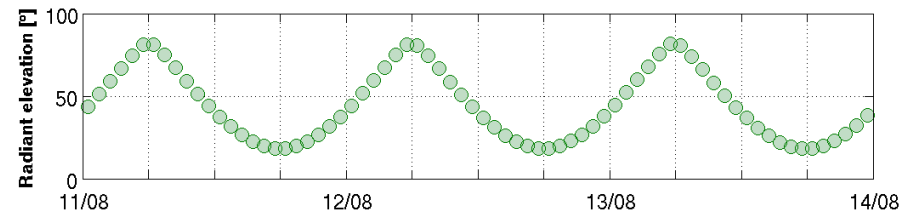
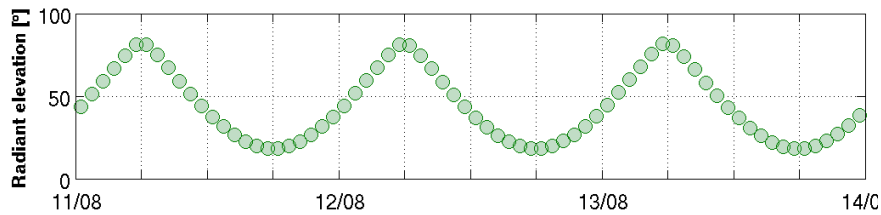
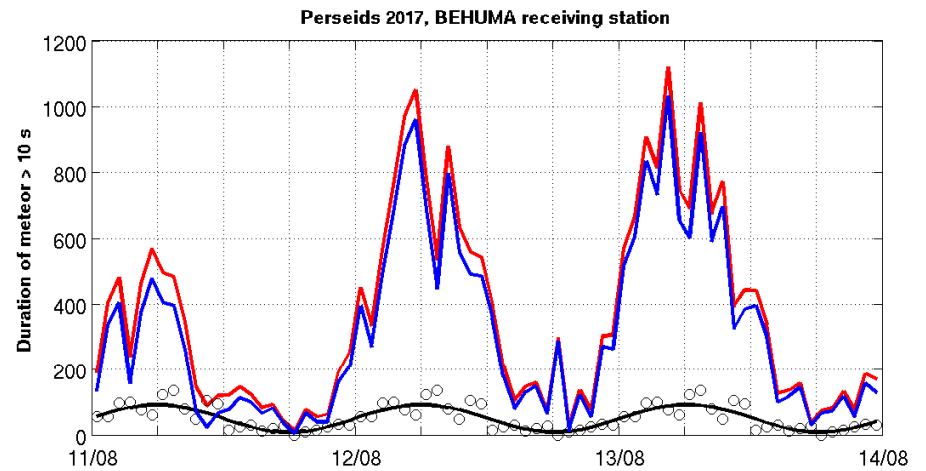


# Perseids 2017, Humain

Number of meteor reflections > 10 s



Total duration of meteor reflections > 10 s



# Improvements

- The current aggregation method provides good results but sometimes creates big rectangles containing several meteor echoes
- So far, each user input has been given the same importance. We plan to introduce weights to favor inputs from very good users and to reject inputs from very bad users
- Correction of the apparent activity curves by the Observability Function (OF)

# What do we do with the results?

- Activity curves
- Tests of the automatic detection algorithms
- Tests for the interferometer



# Conclusions

- The RMZ has been successful so far, both in terms of science return and in terms of outreach/education
- For the future we intend to continue uploading data regularly but we will mostly focus on meteor shower campaigns with a limited number of stations and days