

BRAMS Zoo

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27/06/2015 – BRAMS annual meeting

Why a BRAMS Zoo?

- Goal : to ask a large community of users to manually count meteor echoes for us
- Useful for :
 - Overdense meteor echoes (hardly correctly detected by any automatic detection method so far)
 - Assess of automatic detection methods for underdense meteor echoes
- In line with new politics (“crowdsourcing”)

Contact Citizen Science

CITIZEN SCIENCE  ALLIANCE

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WHAT IS THE CITIZEN SCIENCE ALLIANCE?

The **CSA** is a collaboration of scientists, software developers and educators who collectively develop, manage and utilise **internet-based citizen science projects** in order to further science itself, and the public understanding of both science and of the scientific process. These projects use the time, abilities and energies of a **distributed community** of citizen scientists who are our collaborators.

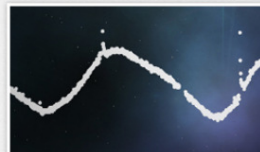
OUR PROJECTS



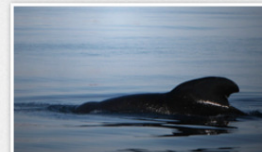
Galaxy Zoo: Hubble



Old Weather



Planet Hunters



Whale FM

Our projects live within the 'Zooniverse', the home of Citizen Science on the web. Each is inspired by a science team who provide the initial ideas, the reassurance that what we're doing can make a real contribution and an audience who are willing to use the end result. We are working with a wide variety of partners, from classicists to climate scientists and ecologists to planetary scientists. [VIEW ALL PROJECTS.](#)

Questionnaire to fill in to send application which is peer-reviewed

Which data to select?

- Initially focus on a few meteor showers in 2016 (more “sexy” for large public than background/sporadic meteors).
- Contains many overdense meteor echoes
- Useful for collaborations e.g. with IMCCE

Estimate of time needed

- 1 min in average per spectrogram
- 1 day of data ~ 5 hours
- Assume 3 meteor showers & 3 days each & 30 stations $\rightarrow 5 \times 3 \times 3 \times 30 = 1350$ hours
- 10 independent measurements on each spectrogram : 13500 hours
- 2000 users $\rightarrow \sim 7$ hours per user
- Results within 4 weeks of the peak : $7 / 12 \sim 0.6$ hour/week (reasonable).

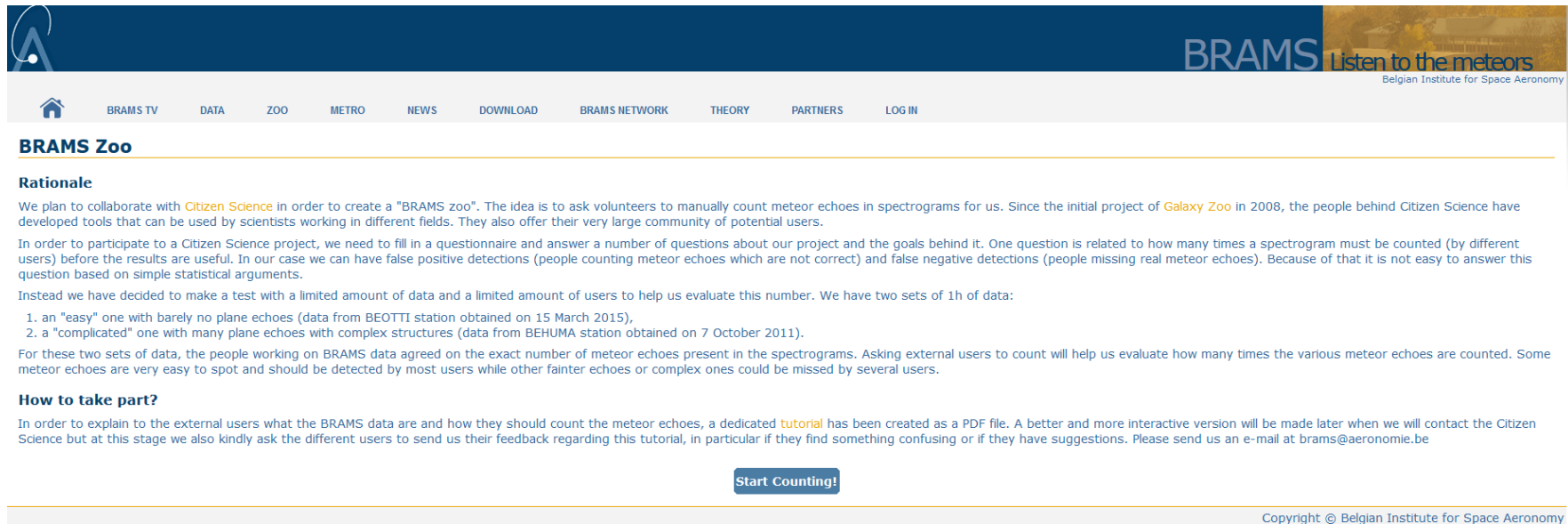
Question is ...

- Are 10 independent measurements enough to be sure to select most of the meteor echoes with a limited amount of FN/FP ?
- No easy statistical tools due to FN/FP to answer this question
- Not like Galaxy Zoo, more similar to Moon Crater Zoo

Instead ...

- We have selected a limited amount of data as sample tests : 2 hours (24 spectrograms), 1h of “easy” data (with very few plane echoes) & 1h of “complicated” data (with many crazy plane echoes)
- We have made a “careful” manual count of these data and tried to come to an agreement on the definition of what we want people to do for us
- We have made a tutorial for BRAMS zoo (PPT/PDF format)
- We will use sets of users as sample tests to investigate how many times a spectrogram must be sent to different users to obtain reliable counts

BRAMS Zoo on the website



BRAMS Zoo

Rationale

We plan to collaborate with [Citizen Science](#) in order to create a "BRAMS zoo". The idea is to ask volunteers to manually count meteor echoes in spectrograms for us. Since the initial project of [Galaxy Zoo](#) in 2008, the people behind Citizen Science have developed tools that can be used by scientists working in different fields. They also offer their very large community of potential users.

In order to participate to a Citizen Science project, we need to fill in a questionnaire and answer a number of questions about our project and the goals behind it. One question is related to how many times a spectrogram must be counted (by different users) before the results are useful. In our case we can have false positive detections (people counting meteor echoes which are not correct) and false negative detections (people missing real meteor echoes). Because of that it is not easy to answer this question based on simple statistical arguments.

Instead we have decided to make a test with a limited amount of data and a limited amount of users to help us evaluate this number. We have two sets of 1h of data:

1. an "easy" one with barely no plane echoes (data from BEOTTI station obtained on 15 March 2015),
2. a "complicated" one with many plane echoes with complex structures (data from BEHUMA station obtained on 7 October 2011).

For these two sets of data, the people working on BRAMS data agreed on the exact number of meteor echoes present in the spectrograms. Asking external users to count will help us evaluate how many times the various meteor echoes are counted. Some meteor echoes are very easy to spot and should be detected by most users while other fainter echoes or complex ones could be missed by several users.

How to take part?

In order to explain to the external users what the BRAMS data are and how they should count the meteor echoes, a dedicated [tutorial](#) has been created as a PDF file. A better and more interactive version will be made later when we will contact the Citizen Science but at this stage we also kindly ask the different users to send us their feedback regarding this tutorial, in particular if they find something confusing or if they have suggestions. Please send us an e-mail at brams@aeronomie.be

[Start Counting!](#)

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Next

- Get more sample users & analyse results
- Answer question & send application to Citizen Science
- Check & possibly connect with people from Moon Crater Zoo