

Interactive comment on “Automatic Georeferencing of Astronaut Auroral Photography” by Maik Riechert et al.

Anonymous Referee #1

Received and published: 6 April 2016

Manuscript gi-2015-44 "Automatic Georeferencing of Astronaut Auroral Photography" by Riechert et al.

The authors report on a method for mapping auroral photographs taken from the International Space Station onto a geographic grid. The georeferenced images have been compared to scientific images from the ground-based network THEMIS. A lot of invaluable work has been put into this project to overcome issues of non-scientific imaging (lack of metadata, unknown pointing direction etc.) to make the photos scientifically useful. The work is carefully documented and I only have some rather

C1

minor comments and questions to add.

Specific comments:

- Adding some typical numbers based on already analyzed images would be very helpful. What is the typical size of a star in an image, in pixels? How much is it allowed to change across the image? How many stars are typically identified in an image and how many would be required as a minimum to produce an acceptable mapping?
- The images are ranked based on the pixel scale variation across the image into very good, excellent and bad (section 4.1). How many images out of the whole set of mapped images is included in each class? The same goes for the other errors. All error sources are very well described but a little note on how common they are in the analyzed set of data is missing.
- Maybe change "camera was did not move" to "camera did not move"
- The conclusion says that the comparison between ground-based and space-based images can be within 12 arcminutes or better. This refers to the sample comparison (Figures 11 and 12) as the worst case scenario. Why is that? Have more than that one comparison with ground-based imager data been done? If yes, what was the overall performance?
- What is the triangle in Figure 4?
- Horizon lines in Figures 8 and 9 are a little hard to see, they could be thicker.
- The word calculated is misspelled in the caption of Figure 10. The geometry drawing is very good but the role of different colours could be described in the caption together with the meanings of the symbols (some of them are missing now).

C2

- White blobs in the THEMIS images (Figures 11 and 12) are probably due to the Moon. That would be worth mentioning.
- The mapped ISS image in Figures 11 and 12 includes some almost vertical shadow-like features. Do you know where they come from?
- Is the vertical auroral feature marked by the magenta arrow in Figure 12 identified from the original image in panel C?

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., doi:10.5194/gi-2015-44, 2016.