

Interactive comment on “On Study of Two-Dimensional Lunar Scan for Advanced Technology Microwave Sounder Geometric Calibration” by Jun Zhou and Hu Yang

Anonymous Referee #1

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General Comments

The manuscript demonstrates how a raster scan of the Moon during a pitch-over manoeuvre can be used for calculating and correcting the boresight pointing error of a microwave sounder. This method is new and relevant for the check-out phase of future microwave sounders, because it makes a good case for pitch-over manoeuvres. It was correctly applied by the authors and their approach is described in a convincing way.

Specific Comments

I see two potential issues with the method the authors employ:

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1. De Bartolomei's comment is not completely addressed by Zhou's answer. The Moon describes a full circle in the sky in about one month, i. e. it moved by about 0.1 degrees during the 14 minutes of the pitch manoeuvre. This is more than most of the misalignments the authors found. How long did it take to carry out the two-dimensional lunar scan observation? How can the authors be sure they calculated the variation of the cost function correctly, when the Moon moved during the observation?

2. The authors give no explanation for the surprising fact that the boresight pointing error of channels 1 - 15 in pitch direction is three times as high as all other errors. Could it be that this error is an artefact caused by the time constant of the receivers V and K/Ka? If the devices react with a little delay to changes in the incoming flux, then they will give their maximum signal only after the Moon was at the origin of the antenna pattern frame.

Technical Corrections:

Page 1, line 15: The authors only explain what the "S" in "SNPP" stands for - it is better to explain the whole abbreviation.

Page 2, lines 17 and 19: I suggest to cite also R. Bonsignori, In-orbit verification of microwave humidity sounder spectral channels coregistration using the moon, Applied Remote Sensing, Volume 12, id. 025013 (2018).

Page 2, lines 19 and 20: I do not understand "the Moon only passes the along-track direction".

Page 2, line 31: There is no Sect. 6.

Page 7, line 16: What are "negative observations"?

Figure 4: Units of axes?

Page 9, line 15: "lower" instead of "higher"?

Figure 5: The red X is hard to see.

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Figure 7: The colours of the two Xs are almost the same.

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