

Reviewer 1

The manuscript (MS) « Spectral analyses of lunar regions observed by MAJIS during the JUICE Earth-Moon flyby» by Francesca Zambon and collaborators reports on the MAJIS opportunity of Moon observations during a flyby. This work demonstrates the potential of MAJIS to characterise both the Moon and Jovian moons' surfaces. I have a few minor comments detailed below. First, about the ratioing method used. Second, about the figures and their clarity. Third, about the comparison between the MAJIS results and those from other instruments.

Ratioing method:

This method is not often used on the Moon (not systematically as for Mars). Dust is less of a problem since the regolith is mainly produced by microbombardment and is representative of the rock just below. There is also less instrumental artefact systematically present at a given spectral window (nothing like the 1.6 $\mu$ m artefact on CRISM data for example). Could the authors clarify how they checked that the “signal” removed by ratioing is mainly noise? Is there, for instance, a visual inspection of the denominator spectrum?

We confirm that the signal removed by ratioing is mainly due to instrumental residuals (e.g. flat field) and systematic noise along the same line. A carefully visual check of each spectrum used as denominator has been performed; images at different wavelengths between 0.5 and 2.2 $\mu$ m of the ratioed cube have been visually checked to verify that this approach does not introduce systematic artefact as a function of wavelength.

The ratioing method appears to work very well to suppress the 1.3  $\mu$ m artefact. I wonder whether this also implies that detecting feldspar-rich surfaces or glassy materials will become significantly more difficult when using this approach. A short comment on this potential limitation would be helpful.

The 1.3  $\mu$ m artefact has a specific spectral shape localized around 1.3  $\mu$ m. In contrast, the band associated with feldspar-rich surfaces or glassy materials is much broader; therefore, the method used here does not compromise the detection of this mineralogy. The same approach has been used in Mustard et al. 2011 (Figure 14b).

Figures:

Figure 5: could be improved by adding numbers to each spectrum and region, as it is difficult to see them in the figures. Also, maybe stack the spectra in panel b so they're clearer to see.

Figures have been improved.

Figure 7: in Fig7a, the southeast seems to be very noisy. Maybe the threshold for detection of a band (stretching) could be modified to make this better? Using a different figure for Mare vs Highland to show a different range of values could give a better idea of the differences between these two areas.

Figures have been improved.

### Comparison to other datasets:

This is an excellent idea. This comparison is done on maps only, and they are difficult to read as is. The trend seems to be confirmed, but this is a very rough estimation. For instance, a more direct comparison between MAJIS and M3/Kaguya or Clementine in specific regions (e.g., between Figures 11 and 13a) could strengthen the discussion. Alternatively, as specific craters have been targeted with the MAJIS data, what about comparing directly with the M3 or Kaguya Spectral Profiler spectra to illustrate the differences more concretely? If such a comparison is not feasible, a brief explanation of the limitations would be useful.

Comparison with M3 is not the main focus of this paper, and unfortunately we do not have the M3 spectral parameter maps data, but only the USGS images. Producing those maps directly from the PDS datasets would require a substantial amount of work and is beyond the scope of the present study. However, I can add a few M3 spectra from selected regions of interest that have been also observed by MAJIS.