

I have reviewed the manuscript “*Spectral analyses of lunar regions observed by MAJIS during the JUICE Earth-Moon flyby*” by F. Zambon and colleagues. The study presents visible-near-infrared hyperspectral reflectance measurements of several locations on the lunar nearside, acquired with the MAJIS instrument during the JUICE spacecraft’s Earth-Moon flyby on its way to the Jovian system. The MAJIS instrument is designed to characterize the composition and physical properties of Jupiter’s atmosphere and the surfaces of its icy moons, with the goal of identifying water ice, minerals, and organic compounds.

Overall, the study is well executed. The authors successfully place the MAJIS observations within the geological context of the Moon and appropriately address the observational challenges. The applied ratioing method is suitable, and the conclusions are generally supported by the data. Although the mineralogical results themselves are not fundamentally novel, the access to mid-infrared wavelengths (and the potential identification of silicate absorption features in this range) is particularly valuable. In this respect, the manuscript provides an insightful demonstration of MAJIS capabilities in preparation for the upcoming JUICE mission.

I recommend publication after addressing the following minor comments:

- While the introduction touches on lunar volcanism, there is room to further connect the results to basaltic mare volcanism. The authors may wish to consider additional context, for example Head et al. (2023): <https://www.degruyterbrill.com/document/doi/10.1515/9781501519895-014/html>
- The authors state that the Lommel–Seeliger law is insufficient for large phase angles. However, other photometric normalization approaches (such as the lunar Lambert model, the Kaasalainen–Shkuratov model, and the Hapke model) have been widely used. Please clarify why these methods were not considered or applied.
- Please note that spectral effects of space weathering are generally thought to saturate within ~1 Gyr. At several points, the manuscript does not clearly reflect this constraint and could be revised for clarity.

Additional specific comments:

- **Line 249:** Space weathering causes spectral reddening, but also significant darkening on the Moon. Please include this aspect.
- **Line 346:** The phrase “lower degrees of space weathering” may be misleading, as it could imply reduced exposure time. It may be more accurate to attribute the observed differences to compositional effects (e.g., higher iron content leading to stronger spectral alteration).

- **Line 354:** The phrase “with progressive space weathering” suggests an ongoing process. Please consider whether space weathering effects in the region have already saturated (e.g., based on unit ages such as Hiesinger units). If so, terms such as “high maturity” or “strong space weathering” may be more appropriate.
- **Figure 5 caption:** Replace “pink box” with “gray box.”
- The figures are sometimes difficult to interpret. If possible, consider extracting and reorienting (tilting) the regions of interest to improve readability like this:

