Erratum: Global absorption center map of the mafic minerals on the Moon as viewed by CE-1 IIM data [Sci China-Phys Mech Astron, 2010, 53(12): 2160–2171]

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The boxes of “Badline Repair”, “Bad pixel Repair” and “Destriping” shown in Figure 3 of the original paper should be in dashed line (see Figure 1) in ref. [1]. They are the tentative work for the following work for producing the global map of the absorption center of the mafic minerals. Relative calibration is the crucial step in the application of IIM data. In this study we have tested “Badline Repair”, “Destriping” and “Flat-field Correction”. By many tests we chose the “Flat-field Correction” for the relative calibration while other boxes were abandoned. The reason is as follows.

Although “bad pixel” does not affect the visual effects very much, when we investigated the “Destriping” we found that bad pixels significantly affect the results of destriping. Therefore, “bad pixel repair” was firstly performed before destriping.

“Flat-field Correction” shown in Figure 3 is the relative calibration which is based on the reflectance normalization. Compared with the statistic method such as “destriping”, “Flat-field Correction” has several merits: (1) the original spectral features of the image remained well; (2) the correction coefficients of each image are the same; (3) the cor-

rected images do not have negative values; (4) this method does not enforce a very severe constraint of uniform land surface. The weakness of this method is that it only has multiplicative factor while no additive factor. Moreover, the visual effects derived from this method are worse than those derived from the “destriping”.

Although “destriping” can produce good visual effects, there exist some potential problems: (1) it has the potential risk of altering the original spectral features; (2) it needs the simple or uniform land surface [2]; (3) the corrected coefficients are variable with different images; (4) the visual effects were affected by many factors of the image itself; (5) it can produce negative values which are of no physical sense. Due to the space limit, we could not give a definite answer about whether these potential problems of the “destriping” method can be solved. Hence, for the final relative calibration we abandoned the statistic method but used the “Flat-field correction”. Whereas “destriping” is simple and the visual effects are good, we still introduced the “destriping” in the text to readers for further research.

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Figure 1 Flowchart of IIM processing and application in this study.

- 1 Wu Y Z, Zhen Y C, Zhen Y L, et al. Global absorption center map of the mafic minerals on the Moon as viewed by CE-1 IIM data. *Sci China-Phys Mech Astron*, 2010, 53: 2160–2171
- 2 Datt B, McVicar T R, Van Niel T G, et al. Pre-processing EO-1 hyperion hyperspectral data to support the application of agricultural indices. *IEEE Trans Geosci Rem Sens*, 2003, 41(6): 1246–1259