**THE CHECK OF TOPOGRAPHIC CORRECTION METHODS BASED ON CE-1 IIM.** S. R. Yu[1], Y. Z. Wu[1, 2], Z. S. Tang[1], [1]Space Science Institute, Macau University of Science and Technology, Macao, China (toniyu90@gmail.com), [2]School of Geographic and Oceanographic Sciences, Nanjing University, Nanjing, 210093, China (yzwu@yahoo.cn).

**Introduction:** CE-1 IIM detected the lunar surface reflectance with 32 bands during 480-960 nm and provides the data with a high spatial resolution (200 m). Iron and titanium concentrations can be directly estimated through this dataset by using Lucey's method [1]. But hyperspectral reflectance data depends on the local solar illumination condition which is always influenced by local topography [2]. Consequently, topographic correction, the normalization of reflectance according to DEM (Digital Elevation Model), should be applied to reduce this effect. C-correction method, which has been proved with the best correction effect for rocky surface in Earth remote sensing task [4], is applied to the study area locating at Crater Kircher (45° W, 67° S), it also performs well in reducing topographic influence on the lunar surface (Fig.1).

Fig.1 The images of original reflectance and topographically corrected reflectance by using C-correction.

**Content Inversion:** The topographically corrected data are also used to recalibration the inversion approaches of FeO and $TiO_2$ contents (Fig.2), and the inversion results with and without topographic correction are shown in Fig.3 and Fig.4. Apparent improvements are made in the shaded and overexposed areas in the north and south crater rim respectively.

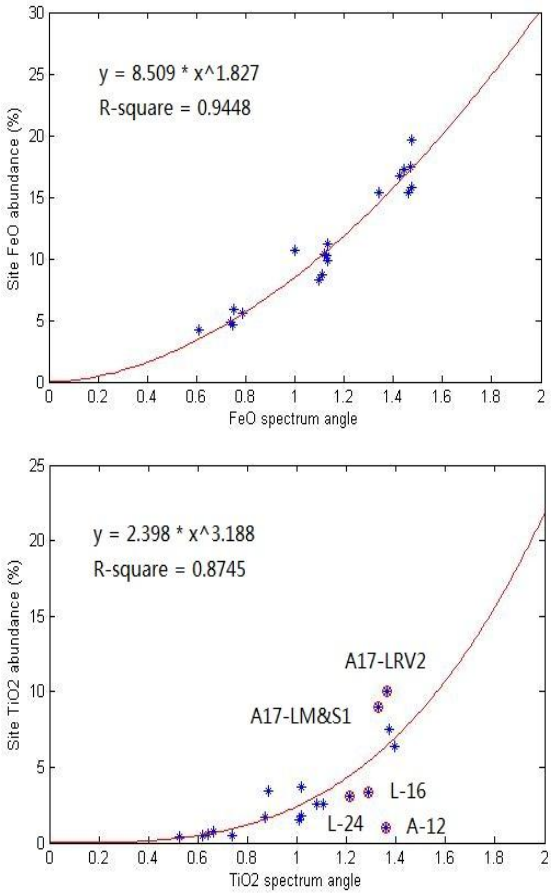


Fig.2 Inversion recalibration of FeO and $TiO_2$ contents. The data points with red circles are eliminated when fits for the curve.

**Influence of cast-shadow:** Even though C-correction achieves acceptable effects in reducing topographic influence on solar illumination condition, the problem of cast-shaded area is also cubersome, e. g. the shadow in the satellite crater to the top of the images in Fig.1. This kind of areas is absolutely shaded and solar radiation cannot reach to there. Due to this reason, it is only illuminated by the scattering light from surrounding and C-correction cannot deal with this condition very well. Fig.3 indicates that cast-shadow leads to the over-estimation of FeO and $TiO_2$ contents. This is one of the research topics in our future research.

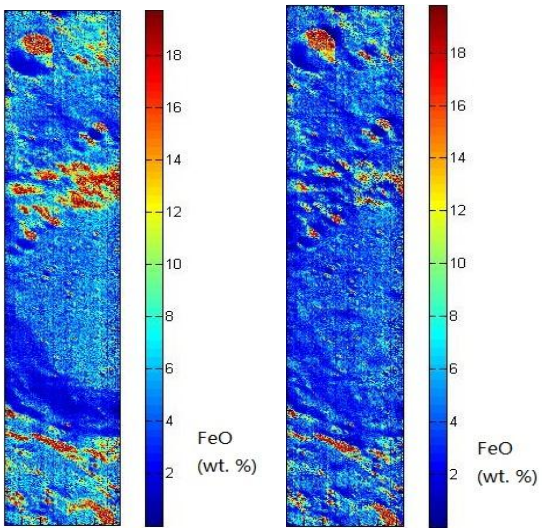


Fig.3 Inversion result of FeO content according to original data (left) and corrected data (right).

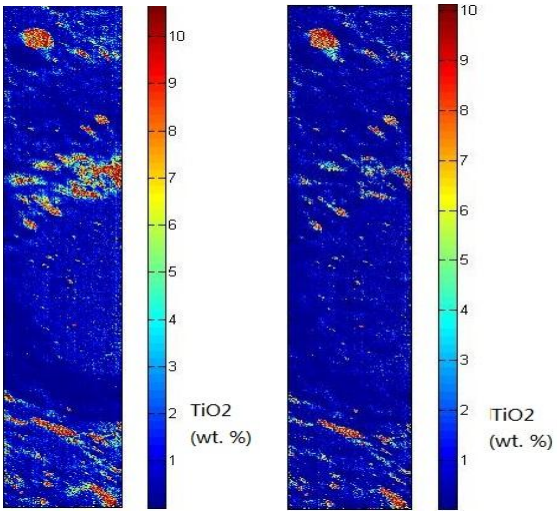


Fig.4 Inversion result of $TiO_2$ content according to original data (left) and corrected data (right).

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