

The Moon as Flux Calibrator for TIR Measurements of Ryugu During the Hayabusa2 Approach Phase in June 2018

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A recent work by Okada et al. (2018) described the Hayabusa2-TIR measurements of the Earth and the Moon before and after the Earth swing-by on 3rd of December 2015. Based on these measurements, it was possible to predict and characterize the TIR detectability of Ryugu (and potential moons) during the satellite Hayabusa2 approach phase in June 2018. We use the TIR lunar observations to establish an independent flux calibration which allows to convert the observed 10-micron TIR signals of Ryugu (during the approach phase in June 2018) into accurate flux densities. These TIR observations also include two full thermal lightcurves taken on June 7 and June 18, 2018. Our thermophysical model of the Moon was tested and verified against multi-channel HIRS measurements of the Moon obtained by different meteorological satellites (NOAA-18, NOAA-19, MetOp-A, MetOp-B). The HIRS channels 8-11 cover nicely the TIR 8-12 micron band and provide high-quality disk-integrated flux densities of the Moon at different phase angles. The Moon-calibrated TIR observations of Ryugu are presented and interpreted in the thermophysical context.