

小惑星探査機はやぶさ2搭載中間赤外カメラの高次データプロダクトのデータアーカイブ

Data achieve of high degree products for Thermal Infrared Imager onboard Hayabusa2

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The Thermal Infrared Imager (TIR) onboard Hayabusa2 carried out thermographic observations of the asteroid 162173 Ryugu in 2018 and 2019 (Okada *et al.*, *Nature*, 2020). TIR precisely determined the brightness temperature of the Ryugu surface within the local areas of 0.5 x 0.5 degrees maps. Also, the thermal inertia, which depended on the surface physical properties of the Ryugu surface, was determined (Shimaki *et al.*, *Icarus*, 2020). The observed data have been published on the web page of PDS/NASA and DATRS/JAXA. The observed raw images (Level-1) and the observed brightness temperature images (Level-2) with the calibration look-up tables are available. The projection maps of the brightness temperature Level-3 products onto the shape model of Ryugu using a geometric correction method (Arai *et al.*, *EPS*, 2021) are prepared. The pointing accuracy was less than 10 m at the altitude of 10 km observations. The seasonal thermal changes on the Ryugu surface are found in the maps. Also, the detailed map shows the low-temperature region of the surface due to the shadow of large boulders. There are, like permafrost regions, only irradiated from the thermal radiation of surroundings. More detailed maps using low-altitude observed images are prepared powered by the correction method of Kouyama *et al.* (*Remote Sensing*, 2017). Thermal inertia maps on the shape model of Ryugu (Level-4) are prepared. HEAT is the data analysis tool for TIR, developed by the University of Aizu (Endo *et al.*, *IEEE*, 2017). HEAT derives the thermal inertia maps by comparing the observed temperature profiles with the database of the surface roughness model (Senshu *et al.*, *International Journal of Thermophysics*, 2022). It calculated the 200,000 polygons for the surface of Ryugu and derived the thermal inertia and roughness parameter values for each polygon. The thermal inertia values are low and spatially homogeneous. It implies that the surface of Ryugu is globally porous.

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