

## An Estimate of rotational prosperities of asteroid Ryugu using simulated image data

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The spin-axis orientation and rotation rate for asteroid Ryugu are essential for the Hayabusa2 mission plan such as landing site selection and scientific researches. Unfortunately, ground-based observations cannot constrain those accurate values because of insufficient light curve quality owing to Ryugu's spherical shape. Therefore, we need to constrain them using images obtained by the optical navigation camera (ONC) onboard Hayabusa2. In the presentation, we will discuss a suitable way to obtain accurate spin-axis orientation and rotation immediately. Then, we utilized images of a vertical asteroid Ryugoid generated for a dry-run test of LSS sequence to simulate the real RYUGU, assumed that the rotational properties of Ryugoid were unknown, estimated rotational properties for Ryugoid, and evaluated its accuracy based on the comparison with the true value. Although Hayabusa2 plans to observe Ryugu in 4 sequences (approach phase, boxA, bocC, and middle altitude), we focused on the image data acquired in approach phase and boxA because we need to determine the rotational properties immediately. Then, we used software called StereoPhotoclinometry (SPC). SPC improves the spacecraft position, spacecraft pointing, and the surface topography of the asteroid, which enable us to solve the rotational properties.

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