

Exploration of Near-Earth Asteroids (4)  
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## THE MOTION ANALYSIS OF SURFACE PARTICLES FOR 101955 BENNU AND 162173 RYUGU

**Abstract**

Asteroids are coming to be a popular topic in the areas of astrophysical studies and deep space exploration recently. Indeed, there are two famous ongoing near-earth asteroid sample return missions, OSIRIS-REx and Hayabusa 2, which attract people's attention greatly. However, surface dynamics of asteroids is still a difficult problem for us. This paper aims at the motion analysis of surface particles for 101955 Bennu and 162173 Ryugu, which are the target asteroids of those two missions. The dynamics analysis method of particles' movement is given for three parts: global motion trend, local motion trend and static analysis. The motion trend of particles on the surface of Bennu and Ryugu is given. The static analysis of surface particles for those two asteroids is also illustrated. Although Bennu and Ryugu are similar in shape, the surface particles' movement of them may have some differences. Then, the results of those two asteroids are compared. This paper could not only provide a reference for asteroid exploration missions but also meaningful for the research of morphologic evolution of asteroids.