Oral | Symbol P (Space and Planetary Sciences) | P-PS Planetary Sciences

[P-PS21_29AM2]Planetary Sciences

Convener:*Satoshi Okuzumi(Graduate School of Science, Tokyo Institute of Technology), Kosuke Kurosawa(Planetary Exploration Research Center, Chiba Institute of Technology), Chair:Peng Hong(Department of Complexity Science and Engineering, Graduate School of Frontier Sciences, The University of Tokyo), Masanori Onishi(Graduate School of Science, Kobe University)

Tue. Apr 29, 2014 11:00 AM - 12:45 PM 416 (4F)

We call for general interest papers for Planetary Sciences. Planetary Sciences consist of a variety of studies on the past, present, and future of our solar system and exoplanetary systems. Discussions based on various backgrounds are encouraged.

12:30 PM - 12:45 PM

[PPS21-P09_PG]N-body simulations of Rubble pile Collisions in Tidal fields

3-min talk in an oral session

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Keywords:rings, satellites, aggregates

We examine collisional disruption of gravitational aggregates in the tidal environment by using local N-body simulations. We find that outcomes of such collision largely depend on impact velocity, direction of impact, and radial distance from the planet. In the case of a strong tidal field corresponding to Saturn's F ring, collisions in the azimuthal direction is much more destructive than those in the radial direction. Numerical results of collisions sensitively depend on impact velocity, and complete disruption of aggregates can occur even in impacts with velocity much lower than their escape velocity. In such low-velocity collisions, deformation of colliding aggregates plays an essential role in determining collision outcomes, because the physical size of the aggregate is comparable to its Hill radius. On the other hand, the dependence of collision outcomes on impact velocity becomes similar to the case in free space when the distance from the planet is sufficiently large. We submitted the results to the Astrophysical Journal.