[EE] Evening Poster | P (Space and Planetary Sciences) | P-PS Planetary Sciences

[P-PS03]Small Bodies in the Solar System: Current Understanding and Future Prospects

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Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

In this session, we welcome presentations regarding small bodies in the Solar System from a variety of approaches (i.e., laboratory experiments, observations, explorations, theoretical modeling, and sample analyses). Especially this year, the Hayabusa2 spacecraft is about to rendezvous with its mission target (Ryugu, C-type asteroid), and ready to make remote-sensing observations for acquiring detailed information of the primordial body. Taking account of the situation, we aim to organize our current understanding of these primordial bodies and further discussing future prospects in this research field.

[PPS03-P20]Heat conduction in highly porous aggregates

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Keywords:comet, dust aggregate, thermal conductivity, planetesimal

The thermal conductivity of dust aggregates is a key parameter for many subjects in planetary science (e.g., thermal evolution of small bodies in our solar system). However, the porosity dependence of thermal conductivity for highly porous aggregates is not yet thoroughly understood.

We investigated the thermal conductivity of fluffy dust aggregates. We used the snapshot data of *N*-body simulations of static compression in the periodic boundary condition (Kataoka et al. 2013) and determined the temperature structure and heat flux of the porous dust aggregates using the method of Sirono (2014).

We derived an empirical formula for the thermal conductivity through the solid network as a function of the filling factor of dust aggregates (Arakawa et al. 2017). The results reveal that the thermal conductivity through the solid network is approximately proportional to the square of the filling factor. For the case of dust aggregates with the filling factor in the range of 0.1−0.5, our results are consistent with the experimental data of Krause et al. (2011). For highly porous aggregates whose filling factor is lower than 0.1, it is revealed that the thermal conductivity through the solid network is significantly lower than previously assumed. In light of these findings, we will reexamine the thermal histories of small bodies.

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