

Ice rheology and tidal heating of Enceladus Ice rheology and tidal heating of Enceladus

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The small Saturnian satellite, Enceladus has an active surface in spite of its small radius (~250 km). Cassini probe observed that Enceladus radiates 6-16 GW of heat from the south polar terrain. One of the effective heat source of Enceladus is tidal heating. However, it is calculated that Enceladus model with Maxwell rheology cannot produce sufficient heat by tidal heating.

In this work we considered Burgers and Andrade model as a ice rheology of Enceladus. Some laboratory experiments have proved that Burgers and Andrade model is more efficient rheology to the stress. We calculated the amount of heat produced by tidal heating by using two rheology models, and found that Burgers and Andrade bodies can produce comparative heat to observed heat flux (~ giga watt).

キーワード: Enceladus, Tidal heating, Ice Rheology

Keywords: Enceladus, Tidal heating, Ice Rheology