A numerical study of a model of ridge formation on icy shell of Europa

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Europa is one of the icy satellites of Jupiter. It is considered that the interior of Europa includes a probable extensive water ocean. This subsurface ocean is made by diurnal tidal working by the gravity of Jupiter. This icy satellite have a global network of numerous and variable lineaments on the surface. Most of the lineaments are double ridge, which shape is two parallel convex prominences with vale middle of them. There are some suggestions of model of ridge formation for each thickness of the icy-shell (Greenberg 1998,Head 1999,Nimmo and Gaidos 2002).

The most popular model of ridge formation is a squeezing model, in which underlying liquid water fills the open cracks, partially freezes, and is extruded during the daily closing of the cracks (Greenberg 1998).

We present the result of a numerical simulation of the solidification process in this ridge formation model, using IDO method (T.Aoki).