Abstract

One of the most interesting extraterrestrial bodies in the Solar System is Europa, the icy satellite of Jupiter. This icy moon might have a sufficiently hospitable environment which could be harbouring life in the subsurface ocean deep under its icy crust. The thesis thoroughly examines the generation process of one of the surface formations called chaotic terrains. These huge areas of ice disruptions which uniquely characterize Europa's surface might play a significant role in the understanding of the inner structure of the moon. The latest research assumes the chaotic terrains form above liquid water lenses perched relatively shallow in the ice shell, however, no numerical simulations have been performed to confirm this theory. The goal of the thesis is to create a model which would validate the theory and explain the formation process of the chaotic terrains. The thesis runs several simulations, and our results suggest these water lenses and the process in the mantle might play a key role in the chaotic terrains formation.