236. The Effects of the Onset of Convection and Thermal Diapirism for Latent Biology in the Ice Shell of Europa

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Europa's chaos and lenticulae may have been origi-nated in relation to thermal diapirs linked to convective upwellings. Thermal convection and diapirism starts if the ice shell is thicker than a critical value (with details depending on the dominant ice rheology, grain size, and intensity of tidal straining). Previously to the onset of convection, possible biological forms living in, or close to, the shell/ocean interphase could result trapped and dormant in ice, due to satellite cooling and thickening of the ice shell. Some biological substances are used to optimize cellular functioning under low water activity conditions, such as low temperature and high osmotic conditions. Trehalose is an example that is frequent in halophilic microorganisms, which could be present on Europa. This kind of compounds can reduce the water melting point to ~230 K, a temperature similar to that at the stagnant lid base. Thus, the onset of thermal di-apirism could cause an event of reactivation of dormant biological forms close to the base of the stagnant lid, since diapirs may warm the neighbor ice by tens of thousand of years.