

Simulation of the radar signal propagation through the crust of Jovian icy moons

In the past few years radar echo sounding (RES) has proven to be an effective tool for studying the interior of planets and moons in the Solar System. Sending radar pulses towards the surface of a celestial body and collecting the reflection, it is possible to investigate the electrical discontinuities of the subsurface. This method is suitable for the search for liquid water behind the surface, since, at radar frequencies, it has very peculiar properties. RIME and REASON, on-board respectively JUICE and Europa Clipper missions, will be concerned with the study of the interior of Jovian icy moons in future years using RES, since it is thought they may have a liquid ocean beneath the icy crust. It is discussed how simulations of radar signal propagation through the icy crust in different condition of temperature, composition and electrical properties will be very useful to interpret the real data from the two missions.