

Science Requirements

1. Measure the **tidal Love number h₂** (on the diurnal cycle of 3.55 days) with an absolute accuracy of better than 0.01 (2 sigma) in order to unambiguously confirm the presence / absence of an ocean and constrain the ice thickness at a level of approx. +/-5 km
2. Measure the **h₂ phase-lag** with an accuracy of < 1° to in order to infer the tidal dissipation of Europa and test the hypothesis of an active silicate layer.
3. **Global topography** up to degree and order 40
4. Test **hydrostatic equilibrium** by measuring topography degree and order 2 coefficients with an accuracy < 50 m
5. **Regional topography** (hundreds of km) 10 km (TBC) per grid size. Vertical resolution : ≤ 5 m (goal: 2m)
6. **Local topography** (tens of km) 50 m per grid size (at polar regions). Vertical resolution : ≤ 5 m (goal: 2m) at the location of the laser profiles
7. Measure Europa's **obliquity** for a geodetic reference system.
8. Determine **rotation rate** for a geodetic reference system and as basis for libration amplitude measurement.
9. Measure the longitudinal **libration amplitude**.
10. Assist the **orbit determination** by measuring residuals at x-over points with an accuracy of < 6 m (TBC). Resolution 10 cm (instrument capability without noise). Ranging accuracy 1m (range measurement including nominal noise).
11. Measure locally (10s of km) the **surface roughness** on footprint scale between 1° and 40° (50m) with an accuracy better than 20% (TBC)for different geological terrain types.
12. Measure **albedo at 1064 nm** wavelength with absolute accuracy of 20 % (TBC) and relative accuracy a few percent (TBC).