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Tidally-Induced Fault Motion within Europa's Ice Shell
and implications for subsurface access missions

Challenge: The processes that maintain a subsurface ocean at Europa may also cause geophysical hazards within the overlying ice shell that are important to understand for any subsurface access mission.

- Our study performed 3D finite element models to better constrain the potential magnitude of tidally induced fault motion in Europa's ice shell

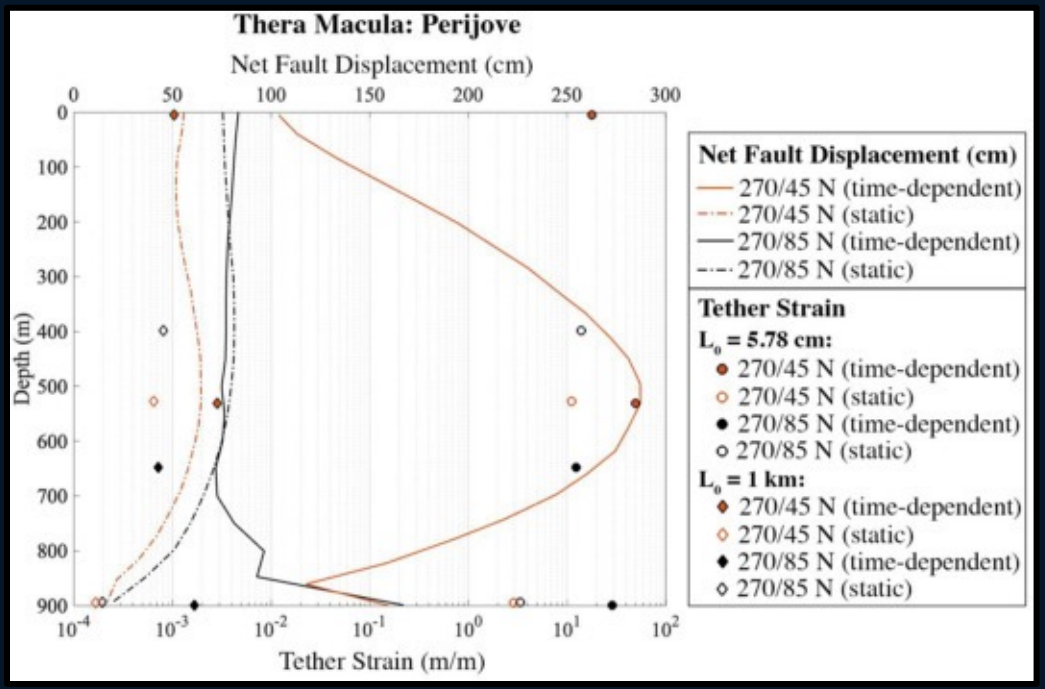

Figure 1. Static and time-dependent net fault displacement at perijove for west-striking (north-dipping faults) at Thera Macula

- Key Results (Fig. 1): (1) Tidal forces on Europa vary with depth and location, driving variations in potential fault displacement
  (2) Time-dependent models more accurately consider motion build-up
- Implication: Fault displacements drive hazard levels for subsurface missions
  → Location hazard level should be assessed for access missions

Figure 2: Artist concept for a cryobot probe subsurface mission (Alexander Pawlusik/NASA)

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