SOLVE: Seismic Orbital Laser VibrometEr

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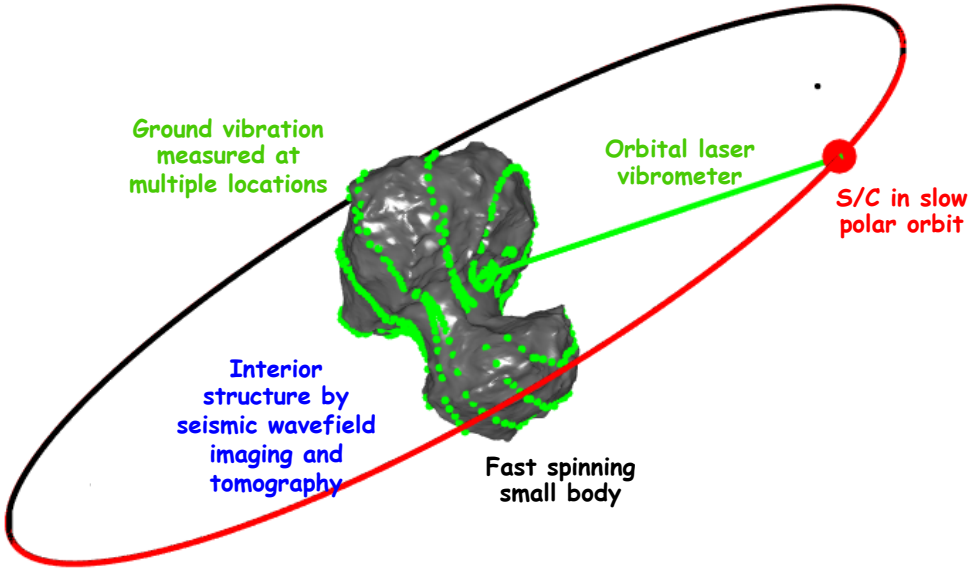
Target: Cometary nuclei, asteroids, and small moons like Phobos.

Science:
Remote sensing seismology from orbit about a small body. Without landing, obtain:
- Global internal structure (reflectivity structure)
- Interior elastic properties (material composition/porosity)

Objectives:

- Develop methodology for imaging the interiors of small planetary bodies using seismic waves acquired with laser vibrometers from orbit, without landers.
- Use 3D wavefield imaging and tomography for high-resolution interior imaging of small planetary bodies with arbitrary exterior geometry and complex interior structure.
- Evaluate suitable seismic sources: endogenic for Phobos and comet nuclei, synthetic for solitary asteroids



Orbital laser vibrometer provides full contactless seismic coverage of a small body for 3D interior wavefield imaging and tomography.

Key Milestones:
- 1/18: kickoff
- 3/18: realistic 3D structural and petrophysical models
- 6/18: 3D elastic seismic simulations on realistic models
- 9/18: Acquisition scenarios and volume assessment
- 12/18: Orbital laser vibrometer (LDV) specifications
- 3/19: Field tests w/ small terrestrial LDV
- 9/19: 3D wavefield imaging of interior reflectors
- 12/19: 3D wavefield tomography of elastic properties

Advance TRL from 2 to 3