Lunar Surface Gravimetry Science Opportunities
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Taurus

VEGA Space Gravimeter Information
• Measures absolute gravity vector, with no bias
• Accuracy: 0.1-1 microG on the Moon
• Bandwidth: 1-10 mHz
• Size: 9.5 x 9.5 x 18.5 cm
• Power consumption: 4-12.5 W (depending on spacecraft temperature)
• Current Technology Status:TRL 4

Introduction
VEGA Instrument
• Gedex has developed a low cost compact space gravimeter instrument, VEGA (Vector Gravimeter/Accelerometer)
• This instrument could be used in various lunar surface science investigations

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Past Lunar Surface Gravimetry
December 1972: Lunar Traverse Gravimeter Experiment on Apollo 17

• Survey conducted by Harrison Schmitt and Eugene Cernan, funded by NASA
• An intriguing gravity low was found at Station 5...
• Science team: Manik Talwani (P.I.), George Thomson, Brian Dent, Hans-Gert Kahle, Sheldon Buck
• The survey “did geophysics,” with the P.I. inferring subsurface structure from gravity results.

Explore Lava Tubes
• Astrobotic Google Lunar X-Prize lander/rover mission to a pit crater in Lacus Mortis
• Gravimeter could “see” subsurface voids from the surface
• Forward modelling of a lava tube was performed to define range of parameters for detectable lava tubes

Detect Lunar Ice
• 2020: NASA Lunar Resource Prospector
• Exploring Permanently-Shadowed Regions near a Lunar pole, looking for signs of ice
• Certain types of plausibly ice deposits would produce measurable gravimetry signals

Taurus-Littrow Follow-up Gravimetry Survey
• PT Scientists is planning a lander/rover mission to Apollo 17 landing site in Taurus-Littrow Valley
• A rover equipped with a VEGA-gravimeter could do a follow-up to the TGE gravity survey
• Survey with increased spatial resolution
• E.g., try to resolve details of the Station 5 gravity anomaly

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