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Das Institut für Physik

Fachbereich Astrophysik und Geophysik

lädt zu folgendem Vortrag

im Rahmen des **Astrophysikalischen Kolloquiums** ein:

"Helioseismic discovery of unexpected high-frequency inertial modes"

Shravan Hanasoge

Department of Astronomy and Astrophysics, Tata Institute of Fundamental Research, Mumbai, India

Classical helioseismology, which relies on acoustic waves, has been successfully applied to image the Sun's interior rotation and structure. However, acoustic waves are insensitive to parameters such as magnetic fields, turbulent viscosity and entropy gradients in the deep convection zone, which are critical inputs to theories of solar dynamics. Inertial oscillations can bridge this gap with their complementary sensitivities to these parameters. Here, by employing helioseismic and correlation-tracking analyses of ground- and space-based observations, we detect equatorially antisymmetric vorticity waves, propagating retrograde at three times the phase speeds of Rossby-Haurwitz waves of the same wavenumber. This high-frequency dispersion relation cannot be explained by standard hydrodynamic mechanisms. We investigate the possibilities that these vorticity waves, excited by the Coriolis force, are modified by internal magnetic fields, gravity or compressibility. Incontrovertible identification of any of these coupled oscillations would influence our understanding of deep-interior magnetism, internal gravity oscillations or large-scale convection. Through observational evidence and theoretical arguments, however, we exclude these coupling mechanisms. In this talk I will describe our efforts to understand these oscillations and use them to constrain the solar interior.

Published paper on this subject:
- https://ui.adsabs.harvard.edu/abs/2022NatAs...6..708H/abstract

Date: **Wednesday, May 31, 2023 - 17:00 CEST (online)**
https://uni-graz.zoom.us/j/6435542130?pwd=L3hiT-lBIM2s3RnpLMDV1azhUUThtdz09

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