

Título/Title:

Gravity waves: a key process in the superrotation of Venus atmosphere?

Orientador/Supervisor:

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Descrição/Description:

Several studies of Mars atmosphere reported large density and temperature fluctuation in form of wave-like structure, supposed to be produced by gravity waves (GW). Those waves, also very frequently detected on other terrestrial planets, play a crucial role in the atmosphere. The primary source and basic characteristics of GW on Mars remain an open question. We propose here to use a sophisticated Mars Global Climate Model (GCM) and an innovative scheme to simulate the propagation of waves in the middle atmosphere, and to study their induced temporal and spatial variation, and their impact on the global circulation.

The student will be involved in the work of the team, focused to better characterize GWs, as well as to identify their possible sources by combining models and observations. In particular, he/she will learn how to use 3D simulations by a General Circulation Model (GCM), and quantify the impact of GW drag in the middle/upper atmosphere using different set of parameters. In addition the student will validate model results with the help of observations (e.g Mars Climate Sounder, Mars Express, MAVEN)

Requisitos/Requirements:

The project is based on the use of python scripts and FORTRAN routines. Therefore, the candidate should be able and willing to program in python and possibly have a basic knowledge of FORTRAN.