



Super-rotation simulated with the new LMD Venus General Circulation Model

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Venus-Express is arriving at Venus, and soon will bring us new insights on Venus atmosphere. In this context, we have developed at the Laboratoire de Météorologie Dynamique a new 3-dimensional General Circulation Model of Venus atmosphere, based on our experience of Earth, Mars and Titan models. The main feature of this new model is the infrared radiative transfer module, which computes the temperature structure self-consistently. This module is based on a temperature-dependent Power Net Exchange matrix, computed with a Monte-Carlo model developed at the Laboratoire d'Energétique de Toulouse. The current version of the model is based on a 48x32 grid, on 50 levels from surface to roughly 95 km altitude. The clouds layers, atmospheric composition and surface interactions are not yet included in our computations (clouds layers are fixed for radiative calculations).

We will present here the first simulations made with this Venus General Circulation Model. Starting from rest, a satisfying super-rotation is developing, with winds of the order of 150 m s^{-1} near the clouds top obtained after thirty Venus days (approximately 3500 Earth days). We will discuss the circulation obtained, how the super-rotation develops, and we will provide analysis of radiative processes and timescales.