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Connecting the atmosphere and the interior in extrasolar gas planets

Aaron Schneider[1,2], Ludmila Carone[3], Leen Decin[2], and Uffe Jorgensen[1]
[1]Niels Bohr Institute, University of Copenhagen, Copenhagen, Denmark (aaron.schneider@nbi.ku.dk)
[2]Instituut voor Sterrenkunde, KULeuven, Leuven, Belgium
[3]APEx, Max-Planck-Institut für Astronomie, Heidelberg, Germany

We investigate how radiatively driven heating and cooling in the upper atmosphere (at pressures below 1 bar) influences the interior temperature profile (at pressures between 1 to 700 bar) by means of dynamical heat transport. To achieve this goal, we perform fully coupled 3D-radiation-hydrodymamical models with the new full RT 3D climate model MITgcm/ExoRadPRT for WASP-43 b and HD209458 b. We show in our simulations under which conditions the interior temperature profile converges to a hot deep adiabat. Furthermore, we show if differences occur between the non inflated WASP-43 b and the inflated HD209458 b due to different flow structures at depth for similar irradiation.