GCM simulations of Mini-Neptunes with a variable molecular weight

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Mini-Neptunes and Sub-Neptunes have a thick gaseous envelope dominated by hydrogen and helium, sometimes enriched with large amounts of water, methane or other volatile compounds. It has been shown that condensable heavy compounds can inhibit convection in these atmospheres. However, the effect of molecular mass on general circulation has not yet been studied in these atmospheres using a Global Climate Model (GCM). To study the influence of molecular mass on an H2-dominated atmosphere with high metallicity, we use the Generic Planetary Climate Model (G-PCM). The dry and wet convection scheme and the thermodynamic equations have been modified to take the variation in molecular mass. We performed 2° resolution numerical simulations to reproduce the general circulation. We investigate zonal circulation resulting from these simulations. Meridional circulation is also studied by using the transformed and classical Eulerian mean formalism. The thermal structure is compared with the structure obtained from radiative-convective simulations.