

Development of a Venus' cloud formation scheme for a convection resolving model

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Although convection has been suggested to occur in the lower part of Venus' cloud layer by some observational evidences, its structure remains to be clarified. In the previous studies, Baker et al. (1998, 2000), Imamura et al. (2014), and Lefevre et al. (2017) try to simulate Venus' cloud-level convection, but their models they utilized do not consider cloud formation process. Our purpose is to develop new cloud formation scheme and to perform numerical simulation using the scheme in order to investigate a possible structure of Venus' cloud-level convection and clouds distribution.

Our cloud formation scheme is based on Imamura and Hashimoto (1998). The number densities of sulfuric acid (H₂SO₄) and water (H₂O) in the gas and liquid phases are calculated. Sedimentation of H₂SO₄-H₂O solution droplets and chemical reactions of sulfuric acid are also considered. The scheme is implemented into our convection resolving model developed by Sugiyama et al. (2009). The model is based on the quasi-compressible system (Klemp and Wilhelmson, 1978), and is used in the simulations of the atmospheric convections of Jupiter (Sugiyama et al., 2011, 2014) and Mars (Yamashita et al. 2017).

In our poster, we will show the details of our cloud formation scheme and demonstrate some results of our calculation using similar settings of Imamura et al. (2014).

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