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太陽彩層における微小構造に関する二次元数値シミュレーション
Two-dimensional simulation of the small scale structure in the solar chromosphere

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Recent observation revealed the highly dynamic and fine structures in the solar chromosphere. The solar chromosphere is known to have wide range of the plasma beta, high nonlinearity with shock waves, cooling from the radiation, thermal conduction by the non-thermal electron, and weak ionization rate. All of the processes above have opportunity contributing to the dynamics of the solar chromosphere. In order to get the proper interpretation of the observation in the solar chromosphere, the numerical simulation with the various effects can be very useful tool. In our study, a new radiative magnetohydrodynamic code is developed for the dynamical simulation of the solar chromosphere. The numerical domain includes the upper part of the convection zone to the lower part of the corona. The convective motion as a driver of the dynamics in the upper atmosphere is consistently modeled using the radiative transfer calculation and the realistic equation of state. The thermal conduction from the non-thermal electron is also included. In this talk, we will report the numerical implementation from this numerical code and the first results filled with small scale structures in the two-dimensional domain.
Keywords: solar chromosphere, wave, convection, magnetohydrodynamics