Three-dimensional Simulation of Chromospheric Jets with Twisted Magnetic Field Lines

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A three-dimensional simulation by the Tokyo code (tentative name) of chromospheric jets with twisted magnetic field lines is presented. We develop a radiation magnetohydrodynamic simulation code for the dynamical modeling of solar atmosphere. The code includes the effect of non-local radiative transfer in the photosphere and optically thin radiative cooling in the upper layer. The Spitzer-type thermal conduction and the latent heat of partial ionization are also taken into account. Tall chromospheric jets with the maximum height of 10--11 Mm and lifetime of 8--10 min are formed above the strong magnetic field concentration. The strongly entangled magnetic field lines are found in the chromosphere, which helps to accelerate these chromospheric jets through the Lorentz force. We also find that the produced chromospheric jets form a cluster with the diameter of several Mm with finer strands.