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Evolution of Non-gyrotropic Pressure in Collisionless Magnetic Reconnection[1] HAIHONG CHE, J. DRAKE, M. SWISDAK, University of Maryland — From the view of statistics, we separate the non-gyrotropic pressure into two multiplied parts: the gyrotropic pressure and the correlation function in particle velocity space. The gyrotropic pressure is related to the heating process. The correlation is determined by the chaotic motion at x-line or by the turbulent process, which depend on the type of the instabilities. We perform both 3D low and high temperature magnetic reconnection particle simulations. The low temperature develop a Buneman instability around x-line while the turbulence is absent in the high temperature simulation. Our simulations show that 1) the resonant chaotic motion occur at x-line while the width of electron current sheet is in the order of electron Lamour radius, which build up a significant correlation in electron velocity space. The contribution to correlation from the turbulence is small because the instabilities occur in our simulation are uncorrelated in the non-gyrotropic space. 2) The anomalous heating also enhance the role of non-gyrotropic pressure . The heating caused by turbulence is much more effective than the heating caused by the chaotic motion.

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