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The role of fluid compression in particle acceleration during magnetic reconnection XIAOCAN LI, The University of Alabma in Huntsville, FAN GUO, HUI LI, Los Alamos National Laboratory, GANG LI, The University of Alabma in Huntsville — Previous theories of particle transport and acceleration have shown that fluid compression is the leading mechanism for particle acceleration or deceleration. However, the role of compression in particle acceleration during magnetic reconnection is unclear. Using fully kinetic simulations, we quantitatively investigate the effect of compression in particle acceleration and energy conversion during magnetic reconnection for a range of plasma beta and guide field. We show that compression has an important contribution in energy release and nonthermal particle acceleration when the guide field is smaller than the reconnecting component. For the case with small plasma beta, the compression leads to strong nonthermal particle distribution that resembles a power law. This results from kinetic simulations may help build a large-scale acceleration model in magnetic reconnection.

Xiaocan Li
The University of Alabma in Huntsville

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