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Localization and propagation of the energy release during 3D kinetic magnetic reconnection

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Reconnection is a key processes where energy is released: magnetic field lines break, merge in a new configuration. In the process some of the energy is released. Recent work by Shay and collaborators has pointed out that energy is released far and moving fast away from the reconnection site, at a speed exceeding several times the Alfven speed. We revisit this point, considering the release of energy from reconnection and considering both laminar processes and turbulent reconnection. We analyse the energy budget and the processes of energy transfer via Poynting flux and particle flows. The results are compared with the recent findings by Shay. The effect of the guide field can be very significant at even relatively weak strength, as our recent analysis shows. The effect on the life cycle of energy is considered.

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