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Suppression of energetic electron transport by double layers in flares TAK CHU LI, JAMES DRAKE, University of Maryland — Recent observations from RHESSI revealed coronal hard X-ray emissions came from an above-the-loop-top source. It is not clear how the flare-accelerated electrons stayed above the loop top for a prolonged period of time. Using particle-in-cell simulations, we set up an initial system of very hot electrons in contact with cold electrons parallel to the local magnetic field, and let it evolve over time. After a short phase of diffusion, a large-amplitude, localized electrostatic electric field (in the form of a classic double layer) spontaneously forms at the boundary between the hot and cold electrons. The double layer then suppresses the hot electron transport into the cold region. The barrier supports a significant temperature drop between the two regions that is sustained for the duration of the simulation. The dynamics of the double layer and the associated transport suppression are being explored.

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