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Kinetic Alfven Waves and Electron Physics in Oblique Slow Shocks[1] LIN YIN, Los Alamos National Laboratory, WILLIAM DAUGHTON, University of Iowa, DAN WINSKE, Los Alamos National Laboratory — Particle-in-cell simulations are used to examine kinetic Alfven waves and electron physics in very oblique slow shocks and in slow shocks with moderate shock angles under low electron beta conditions. In these shocks, the downstream has a parallel electron temperature anisotropy, as observed in slow shocks in space. The anisotropy results from electron heating through Landau resonance in the parallel electric fields of obliquely propagating kinetic Alfven waves (KAW) excited by ion-ion streaming. In the shock ramp, spiky structures occur in density and electron parallel temperature, where the ion parallel temperature decreases due to the reduction of the ion backstreaming speed. The electron and ion dynamics in the KAW fields found in slow shocks are further confirmed with results from simulation and linear Vlasov theory of ion-ion streaming interaction without the shock. PIC or a hybrid method with a more sophisticated electron fluid model are required to accurately model the dissipative and acceleration processes in these slow shocks.

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