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Noninvariance of Energy-Momentum Scale Ranges in Vlasov Simulations of Relativistic Interactions and Warm Wavebreaking of Relativistic Plasma Waves¹ ALEC THOMAS, University of Michigan — For certain classes of relativistic plasma problems, using a Lorentz boosted frame can be even more advantageous for gridded momentum space-position space-time simulations than Vay [Vay PRL 2007] showed was the case for position space-time simulations, resulting in speed up proportional to γ_{boost}^6 . The technique was applied using a Spectral Vlasov code to the problem of warm wavebreaking limits in relativistic plasma and demonstrates numerical results consistent with the analytic conclusions of Schroeder et al. [Schroeder PRE 2005]. By appropriate normalization, a self-similar behavior for the Vlasov equation in different Lorentz frames is found. These results are relevant to beam and laser driven plasma based accelerators and the potential for Vlasov simulation of them.

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