Abstract Submitted
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Heat dissipation in relativistic single charged fluids[1] A. L. GARCIA-PERCIANTE, Universidad Autonoma Metropolitana - Cuajimalpa, A. SANDOVAL-VILLALBAZO, D. BRUN-BATTISTINI, Universidad Iberoamericana — When the temperature of a fluid is increased its out of equilibrium behavior is significantly modified. In particular kinetic theory predicts that the heat flux is not solely driven by a temperature gradient but can also be coupled to other thermodynamic vector forces. We explore the nature of heat conduction in a single component charged fluid in special relativity, where the electromagnetic field is introduced as an external force. We obtain an electrothermal effect, similar to the mixture's cross-effect, which is not present in the non-relativistic simple fluid. The general lines of the corresponding calculation will be shown, emphasizing the importance of reference frame invariance and the origin of the extra heat sources, in particular the role of the modified inertia and the difference in fluid's and molecules' proper times. The constitutive equation for the heat flux obtained using Chapman-Enskog's expansion in Marle's approximation will be analyzed together with the corresponding transport coefficients.The impact of this effect in the overall dynamics of the system here considered will be briefly discussed.

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