Abstract Submitted
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Establishment of the thermoelectric effect in Kaluza's MHD through the kinetic theory[1] A.R. SAGACETA-MEJIA, Departamento de Fisica y Matematicas, Universidad Iberoamericana, A.L. GARCIA-PERCIANTE, Departamento de Matematicas Aplicadas y Sistemas, Universidad Autonoma Metropolitana-Cuajimalpa, A. SANDOVAL-VILLALBAZO, Departamento de Fisica y Matematicas, Universidad Iberoamericana — The study of the behavior of charged gases in curved space-times is an active research area in which cross effects, such as thermoelectricity, have not been studied in depth. In our kinetic description of transport theory the electric charge is introduced into the fifth component of the particle velocity, following the idea first proposed by Kaluza in 1919. Using Chapman-Enskog's method, the first order in the gradients correction to the gas distribution function is established, noticing that some of the thermodynamic forces present in the system are associated with the space-time curvature. It is shown that with this distribution function, it is possible to obtain the well-known expressions that relate the heat flux with the electric field in a dilute gas, without resorting to the steady state approximation. This formalism corresponds to an extension of the result obtained for the case of the direct effect between the particle flux and the electric field within Kaluza's MHD (A. Sandoval-Villalbazo, A. R. Sagaceta-Mejía, A. L. García- Perciante; Journal of Non-Equilibrium Thermodynamics, 2015, Vol. 40, pp. 93-101.)

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