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Description of the non-equilibrium extension of Tolman's law in terms of kinetic theory: suppression of the acceleration term and the use of the geodesic in the treatment of Boltzmann's equation[1] DOMINIQUE BRUN-BATTISTINI, JOSE HUMBERTO MONDRAGON-SUAREZ, ALFREDO SANDOVAL-VILLALBAZO, Universidad Iberoamericana, Departamento de Fisica y Matematicas, ANA LAURA GARCA-PERCIANTE, Universidad Autonoma Metropolitana-Cuajimalpa, Departamento de Matemticas Aplicadas y Sistemas — In 1936, Richard C. Tolman showed that in thermodynamic equilibrium a temperature gradient can be compensated by a gravitational potential gradient. In reference [1], in a linearized gravity approximation, Tolman's law was extended for inhomogeneous non-equilibrium systems, suggesting that the contribution of the gravitational field to heat flow can be seen as a cross effect. In this work this contribution to the heat flux for a dilute simple fluid in an isotropic Schwarzschild metric is analyzed. In this case, the effect of the field is contained in the covariant derivative, such that the molecules follow geodesics. The results show that the effect of the field on the heat flux does not vanish, in contrast with what is suggested by other authors [2]. [1] Sandoval-Villalbazo, A., Garcia-Perciante, A. L. & Brun-Battistini D.; Phys Rev D 86, 085014 (2012) [2] Kremer, G. M.; J. Stat. Mech. P04016 (2013)

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