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**Linear irreversible thermodynamics, efficiency and coefficient of performance of a thermal Brownian motor in tight coupling**[1] MULUGETA BEKELE, ANTENEH GETACHEW, Department of Physics, Addis Ababa University, Addis Ababa, Ethiopia, ARUN JAYANNAVAR, Institute of Physics, Sachielaya Marg, Bhubaneshwar, India — We analytically study a thermal Brownian motor and calculate the Onsager's coefficients near a *finite* stall force in the spirit of recent development in non-equilibrium steady state thermodynamics. We show that the reciprocity relation holds and the determinant of the Onsager's matrix vanishes *when heat leakage is neglected*. This condition implies that the device is built with tight coupling and hence Carnot's efficiency can be achieved for the quasi-static process. We also show that the efficiency at maximum power to be exactly half of Carnot's efficiency. Under similar condition we explore the coefficient of performance when our model works as a refrigerator.

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