

THERMOPHORESIS OF BROWNIAN PARTICLES DRIVEN BY
COLORED NOISE

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A mesoscopic Brownian particle diffusing in a temperature gradient is driven by collisions with molecules of the surrounding fluid. The noise associated with these collisions is colored because of hydrodynamic memory. I will give a possible model for the particle's motion in the form of a system of stochastic differential equations. When the time correlation of the colored noise and the relaxation time of the particle are of the same order the effective approximating SDE, in the limit as these two time scales go to zero, involves a drift term that changes magnitude and sign, depending on the particle's mass, so that heavier particles move from colder places to hotter. I will discuss the interpretation and shortcomings of this model in relation to the physical process.