

# Experimental investigation of the connection between thermophoresis and thermo-osmosis

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When a solid surface is exposed to the temperature gradient of fluids in contact, a creeping flow is induced along the surface. This thermal flow, often referred to as thermo-osmosis, plays an important role in micro- and nanoscale thermo-fluid mechanics. For instance, suspended particles in locally heated fluids are expected to move in the opposite direction of thermo-osmosis which is driven near the surfaces of particles. Such migration of particles is known as thermophoresis and was investigated experimentally in Ref [1] by characterizing the thermo-osmosis along the surface of thermophoretic microparticles. In particular, flow evaluation using the optical trapping of tracers revealed the connection between thermophoresis and thermo-osmosis [1].

[1] T. Tsuji, et al., "Thermo-osmotic slip flows around a thermophoretic microparticle characterized by optical trapping of tracers", *Physical Review Applied* 20 (5), 054061 (2023)

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**MPI-DS, Prandtl Hall and Zoom**



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