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Thermal levitation of 10 um size particles in low vacuum LONG FUNG FRANKIE FUNG, NICHOLAS KOWALSKI, COLIN PARKER, CHENG CHIN, James Franck Institute, Enrico Fermi Institute, Department of Physics, University of Chicago — We report on experimental methods for trapping 10 micron-sized ice, glass, ceramic and polyethylene particles with thermophoresis in medium vacuum, at pressures between 5 Torr and 25 Torr. Under appropriate conditions particles can launch and levitate robustly for up to an hour. We describe the experimental setup used to produce the temperature gradient necessary for the levitation, as well as our procedure for generating and introducing ice into the experimental setup. In addition to analyzing the conditions necessary for levitation, and the dependence of levitation on the experimental parameters, we report on the behavior of particles during levitation and ejection, including position and stability, under different pressures and temperatures. We also note a significant discrepancy between theory and data, suggesting the presence of other levitating forces.

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