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Particle motion inside Ekman and Bödewadt boundary layers¹ MATIAS DURAN MATUTE, STEVEN VAN DER LINDEN, GERTJAN VAN HEI-JST, Eindhoven University of Technology — We present results from both laboratory experiments and numerical simulations of the motion of heavy particles inside Ekman and Bödewadt boundary layers. The particles are initially at rest on the bottom of a rotating cylinder filled with water and with its axis parallel to the axis of rotation. The particles are set into motion by suddenly diminishing the rotation rate and the subsequent creation of a swirl flow with the boundary layer above the bottom plate. We consider both spherical and non-spherical particles with their size of the same order as the boundary layer thickness. It was found that the particle trajectories define a clear logarithmic spiral with its shape depending on the different parameters of the problem. Numerical simulations show good agreement with experiments and help explain the motion of the particles.

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