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COMPARATIVE NUMERICAL ANALYSIS OF SINGLE SPHERES MOTION INTO TWO FLUIDS

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Abstract. In this work we present the modeling of single rigid spheres falling into viscous fluids considering the air-liquid interface. The physical model consists of a sphere falling down a tube partially filled with a liquid. Spheres of silicone and glass are used falling into different liquids: oil and water. The computations are performed using two different approaches previously developed in the framework of the finite element method: a fractional step formulation with adaptive mesh and time step sizes and a monolithic fixed mesh technique. The aim of the present analysis is to compare the numerical results predicted by different numerical formulations and to validate their responses with experimental data.