SEMINARIO DE ANÁLISIS NUMÉRICO Y MODELACIÓN MATEMÁTICA

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Fluids, particles and magnetism: mathematical modelling and applications

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Resumen

Combined flows of fluids and particles are very frequent, either in environmental phenomena or in industrial processes: landslides, sediment transport in rivers, chemical reactors, food and drugs industry, etc. In all these flows, it is crucial to understand the coupling mechanisms between the fluid and the particles and how they determine the dynamics of the flow, specially if we are interested to assess what can and what cannot be controlled on the flows. In this talk, I will give an overview of three problems involving the flow of particles in three different contexts: the stability of fluidised beds via a continuum formulation, a hybrid CFD-DEM simulation of the collapse of a granular column in an ambient fluid and the dynamics of two magnetic particles in sedimentation in a viscous fluid as a model of aggregation in magnetic fluids.