Abstract Submitted
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Particle motion in a periodic driving flow. The role of added mass force and the finite size of particles.[1] GERARDO RUIZ CHAVARRIA, ERICK JAVIER LOPEZ SANCHEZ, Facultad de Ciencias, Universidad Nacional Autonoma de Mexico — The motion of particles in a fluid is an open problem. The main difficulty arises from the fact that hydrodynamical forces acting on a particle depend on the flow properties. In addition, the form and the size of particles must be taken into account. In this work we present numerical results of the particle transport in a periodic driving flow in a channel flushing into an open domain. To study the transport of particles we solve the equation of motion for a spherical particle in which we include the drag, the gravity, the buoyancy, the added mass and the history force. Additionally we include the corrections for a particle of finite size. For solving this equation a knowledge of the velocity field is required. To obtain the velocity field we solve the Navier Stokes and the continuity equations with a finite volume method. In the flow under study a vorticity dipole and a spanwise vortex are present, both have an important influence on the motion of particles. The dipole enhances displacement of particles because flow between vortices behaves like a jet and the spanwise vortex produces the lifting and deposition of particles from/to the bottom. We observe clustering of particles both into the channel and in the open domain as observed in coastal systems.

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