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Experimental Study of the Transport of Microplastics in an Open-channel Bifurcation

November 22nd, 2024, 11:30 -13:00

KIT, Bldg.10.81, Room 305

or online:

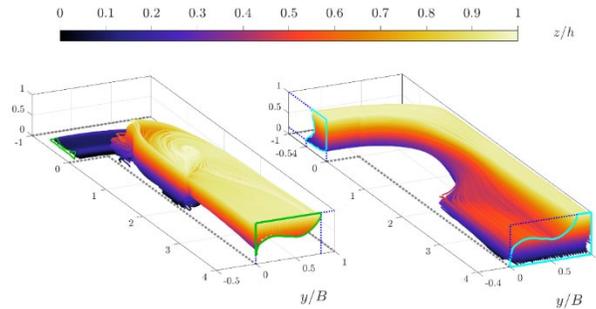
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Meeting-ID: 659 4592 8399

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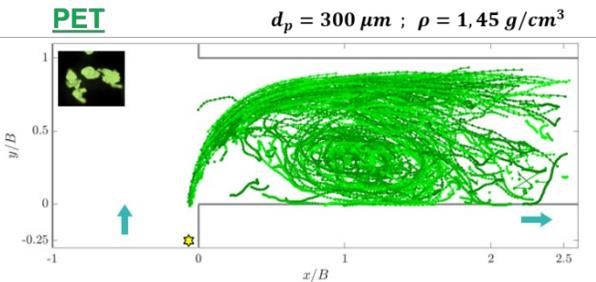


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Abstract

Many end-of-life plastic products, particularly microplastic waste, manage to evade treatment and recovery systems end up in numerous aquatic environments. Urban areas are the main source of microplastic generation and pollution, with particles resulting from the fragmentation of plastic packaging, the abrasion of tyres on roads or shedding from synthetic clothing on washing machine drums. My thesis's objective is to investigate the plastic microparticle transport mechanisms in a simplified system representative of a combined storm overflow—a bifurcation flow—using an experimental approach. The process incorporates: (1) The development and characterisation of physico-chemically representative model microparticles. (2) The characterisation of several free-surface bifurcation flows. (3) An experimental study of the transport of model microparticles within a bifurcation flow. Additionally, in order to forecast microplastic concentration distributions, an analytical Lagrangian-Eulerian coupled transport model is being implemented. Ultimately, this research will enable to identify the key characteristics of microplastic transport, such as deposition and accumulation zones, residence times, recirculation in the water column, etc. This should make it possible to identify the sewage network compartments that are at risk from microplastics and, in the end, to suggest trapping methods.



Biography

Okba Mostefaoui has a master of mechanical engineering and is currently finishing its PhD in Fluid Mechanics and Material Science at INSA Lyon. He is part of both the Fluid Mechanics and Acoustics Laboratory (LMFA) Polymer Materials Engineering Laboratory (IMP).

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