<div align="center">Mini-Symposium Proposal</div>

Title: Advancement in Numerical and Physical Modeling of Free-Surface Flows

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Abstract:

Interfacial flow, in which the free surface evolves as part of the solution of the problem itself, is one of the biggest challenges in computational fluid dynamics.   The moving interface needs to be resolved with adequate numerical accuracy and robustness.   Special care has to be taken to address the discontinuities and singularities in mathematical and numerical formulations. Moreover, the presence of a free surface substantially increases the complexity of the physical problem and introduces new phenomena, e.g., surface vorticity, surface tension and its variations, modulation of turbulent structures by a wavy boundary, and wave-turbulence interactions.   All these processes require special, physics-based modeling, on which our current knowledge is far from sufficient and there is a critical need of research.

The topics of this symposium cover aspects in both numerical techniques and physical models related to the dynamics of interfacial flows.   Advancements and new applications of interface tracking/capturing methods such as VOF, level set, front tracking, ALE/mesh-adaptation, and immersed boundary are among the topics of interest.   Physical modeling of various transport and mixing processes across free interfaces is also well suited and within the scope.   This symposium aims to promote the interaction and collaboration among numerical specialists and physical modelers in the field of simulation-based interfacial flow study.