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**Collision between immiscible drops with large surface tension difference** MARCO ARIENTI, XIAOYI LI, MARIOS SOTERIOU, United Technologies Research Center, MARK SUSSMAN, Florida State University — Immiscible drop collision, as occurring in fuel-oxidizer sprays or in the release of certain fire-extinguishing agents, tends to exhibit a much richer behavior with respect to miscible drops collision thanks to the formation of a liquid-liquid interface during impact. For instance, in near-head-on diesel-water drop collisions, “overlying” may occur in which the diesel oil flows from the collision point around the water drop to gather at the opposite location of the drop. To simulate this class of multi-material flows, the combined volume-of-fluid / level set methodology that sharply captures a single liquid-gas interface (*Sussman et al, J. of Comp. Phys., 2007*) needs to be duplicated for a second, independent interface. In this presentation, we will show that simulation results are not affected by the reconstruction order of the interfaces, as in other surface capturing methods. We will also propose different numerical solutions to treat surface tension in the triple point computational cells, and examine the characteristics of the flow developing at the contact line between the two liquids and air in overlying head-on collisions.

Marios Soteriou  
United Technologies Research Center

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