Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Computational investigation of negatively buoyant jets LEANDRE
BERARD, MEHDI RAESSI, Univ of Mass - Dartmouth — We present computa-
tional results on the stability of negatively buoyant jets at various Richardson num-
bers and injection angles. The results show a critical Richardson number that is the
boundary between stable and unstable behavior. The critical Richardson number is
seen to vary with injection angle. The computational results also reveal the mecha-
nisms leading to instability and shedding of oil ring structures. The computational
tool is a 3D GPU-accelerated MPI-parallel two-phase flow solver. The governing
equations are solved using the two-step project method in the finite volume context.
The fluid interfaces are tracked using the volume-of-fluid method. The pressure
Poisson solver is accelerated using GPUs, which provides an average acceleration
factor of 5 in 3D parallel simulations.

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Date submitted: 31 Jul 2014   Electronic form version 1.4