Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Streamlined air-cavities formed by non-superhydrophobic spheres impacting water[1] ADITYA JETLY, IVAN URIEV VAKARELSKI, SIGURDUR THORODDSEN, King Abdullah University of Science and Technology — The formation of a stable and streamlined gas cavity following the impact of a sphere on a deep pool, is a recently observed phenomenon[1], which shows motion at near-zero drag. This was shown for both Leidenfrost as well as superhydrophobic spheres. We now extend these results by demonstrating that both metallic and non-metallic spheres, with contact angles between >30and 120, can also form stable streamlined cavities, when they are dropped from sufficient height above the pool surface, ranging from 2 to 4 m. The stable streamlined cavity is attached to the sphere surface just above the equator, instead of being wrapped completely around it. This sphere-with-attached-cavity exhibits slightly narrower shape, but retains the near-zero drag and the free-fall velocity is in compliance with the Bernoulli Law of potential flow[2]. [1]Vakarelski et al., *Science Advances, 3: e1701558 (2017).* [2]Vakarelski*, Jetly & Thoroddsen, *Soft Matter*, *10.1039/C9SM01025D (2019).*

[1]This work was funded by King Abdullah University of Science and Technology (KAUST).

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Date submitted: 01 Aug 2019 Electronic form version 1.4