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The splash of a ball hitting a liquid surface: Numerical simulation of the influence of wetting GUSTAV AMBERG, MINH DO-QUANG, The Linne FLOW Center, KTH, Stockholm — The impact of a solid object on a free liquid surface is quite complex. This problemchallenged researchers for centuries and remains of interest today. Recently, Duez et al [1] published experimental results on the splash when solid sphere enters water. Surprisingly, a small change in the surface chemistry of an object can turn a big splash into an inconspicuous disappearance and vice versa. We study this problem by solving the Navier-Stokes together with the Cahn-Hilliard equations. This system allows us to simulate the motion of a free air-water surface in the presence of surface tension, as a sphere impacts the surface. Including the surface energies of the dry and wet solid surface in the formulation gives a reasonably quantitative description of the dynamic wetting that takes place. Numerical results at different wetting properties and impact speeds will be presented and compared with the recent experiments of Duez et al.

[1] Duez, C. et al. Nature Phys. 3, 180–183 (2007).

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