1012-35-156 **Daniel Coutand** and **Steve Shkoller*** (`shkoller@math.ucdavis.edu`), Department of Mathematics, University of California at Davis, Davis, CA 95616. *Well-posedness of the free-surface Euler equations with or without surface tension.*

The incompressible Euler equations with a free surface describe the motion of an ideal, inviscid fluid whose boundary or interface moves with the the fluid. We prove well-posedness for this PDE for short-time and any initial data in sufficiently smooth Sobolev spaces, with or without surface tension. The method requires spacetime a priori estimates, as well as the construction of a new class of approximate solutions for the Euler equations. (Received September 19, 2005)

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