1038-35-338 **Joseph Biello** and **John K Hunter*** (`jkhunter@ucdavis.edu`), Department of Mathematics, University of California at Davis, Davis, CA 95616. *Nonlinear waves with constant frequency and surface waves on vortex patches.* Preliminary report.

We consider an inviscid Burgers-Hilbert equation as a model equation for nonlinear waves whose linearized frequency is constant. We show that weakly nonlinear solutions satisfy a cubically nonlinear, nonlocal quasilinear Schrodinger equation that may be derived by the method of multiple scales, or by the use of a near-identity transformation to eliminate nonresonant terms from the Hamiltonian. We show that the same asymptotic equation describes surface waves on the boundary of a nearly planar vortex patch, which have constant linearized frequency, and we discuss singularity formation and other properties of the equation. (Received February 12, 2008)