1059-42-237 **Yen Q Do*** (qdo@math.ucla.edu), UCLA Department of Mathematics. *A nonlinear stationary phase method for oscillatory Riemann-Hilbert problems.* Preliminary report.

Using the Fourier transform, solutions of a linear PDE with constant coefficients can be written as oscillatory integrals whose long-time asymptotics can be studied using the stationary phase method. A Riemann-Hilbert problem is a factorization problem and it can be used to invert the one-dimensional scattering transform, which is a nonlinear Fourier transform for many nonlinear PDEs. I will describe a nonlinear analogue of the classical stationary phase method which can be used to obtain long-time asymptotics for solutions of such nonlinear PDEs from their oscillatory Riemann-Hilbert formulations. (Received February 23, 2010)