

Title: High-Order Rogue Waves and Solitons, and Solutions Interpolating Between Them

Abstract: A family of exact solutions to the focusing nonlinear Schrödinger equation is presented that contains fundamental rogue waves and multiple-pole solitons of all orders. The family is indexed with a continuous parameter representing the "order" that allows one to continuously tune between rogue waves and solitons of different integer orders. In this scheme, solitons and rogue waves of increasing integer orders alternate as the continuous order parameter increases. For example, the Peregrine solution can be viewed as a soliton of order three-halves. We show that solutions in this family exhibit certain universal features in the limit of high (continuous) order. This is joint work with Deniz Bilman (Cincinnati).