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From numerical computations to wave kinetic theory for the Benjamin—Ono equation

We introduce a new approach for solving the Benjamin—Ono equation as well as other integrable PDEs, based upon recent theoretical breakthroughs on explicit formulas for these equations. It opens the way to numerical approximations which are far more accurate and efficient for simulating these equations, allowing for the study of the asymptotic behavior of the solutions. Moreover, in the setting of randomized initial data, by rescaling and iterating this explicit formula, combined with matrix concentration inequalities, we obtain insight on the Wave Kinetic theory for BO, up to the physically relevant kinetic time scale.