1082-35-95 **Oana Pocovnicu***, Fine Hall, Washington Rd, Princeton, NJ 08544-1000. *Effective dynamics of a non-linear wave equation.*

We consider the non-linear wave equation on the real line $iu_t - |D|u = |u|^2u$. Its resonant dynamics is given by the Szego equation, which is a completely integrable non-dispersive non-linear equation. We show that the solution of the wave equation can be approximated by that of the resonant dynamics for a long time. The proof uses the renormalization group method introduced by Chen, Goldenfeld, and Oono in the context of theoretical physics. As a consequence, we obtain growth of high Sobolev norms of certain solutions of the non-linear wave equation, since this phenomenon was already exhibited for the Szego equation. (Received June 28, 2012)