ADILBEK KAIRZHAN, University of Toronto

Asymptotic stability near the soliton for quartic Klein-Gordon in 1D

In this talk we discuss the nonlinear focusing Klein-Gordon equation in $1+1$ dimensions and the global space-time dynamics of solutions near the unstable soliton. We give a proof of optimal decay, and local decay, for even perturbations of the static soliton originating from well-prepared initial data belonging to a subset of the stable manifold constructed in Bates-Jones (Dynamics reported, 1989) and Kowalczyk-Martel-Muñoz (J. Eur. Math. Soc., 2021). Our results complement those of Kowalczyk-Martel-Muñoz (J. Eur. Math. Soc., 2021) and confirm numerical results of Bizon-Chmaj-Szpak (J. Math. Phys., 2011). In particular, we provide new information both local and global in space about asymptotically stable perturbations of the soliton under localization assumptions on the data.

This is a joint work with Fabio Pusateri.