CLEMENT GALLO, McMaster University, 1280 Main Street W., Hamilton, ON L8S 4K1
Transverse instability for the dark solitons of the cubic defocusing NLS equation

In one space dimension, the cubic defocusing Nonlinear Schrödinger equation

$$i\partial_t u + \Delta u + (1 - |u|^2)u = 0, \quad (t, x) \in \mathbb{R} \times \mathbb{R}^d$$

admits solitary waves which do not vanish at infinity, the so-called dark solitons.

These dark solitons are orbitally stable for the dynamic of the one-dimensional equation $(d = 1)$.

The dark solitons can also be seen as solutions of the two-dimensional equation $(d = 2)$, being constant in the transverse direction.

The purpose of this talk is to show that they are nonlinearly unstable for the dynamic of the two-dimensional equation.