Title: Optical solitons in nematic liquid crystals: nonlocal and saturation effects

Panayotis Panayotaros, IIMAS, Univesidad Nacional Autónoma de México, México

ABSTRACT:

We present mathematical results on the formation of stable optical solitons in nematic liquid crystals. The interaction of the laser beam with the nematic liquid crystal director field near the beam is modeled by a nonlinear Schrödinger equation coupled to a differential equation for the nonlocal response of the material. The simplest models assume that the beam causes a small change in the nematic director angle and can describe adequately the stabilization of the beam above a power threshold, as well as diffraction for small optical power [1], [2]. We present recent results on a more general model that is valid for large changes in the director angle and can also capture the saturation of the nonlinearity in a physically meaningful way. This is joint work with Juan Pablo Borgna, U. San Martin, Argentina, Diego Rial, and Constanza Sanchez de la Vega, U. Buenos Aires, Argentina.

References

[1] P. Panayotaros, T. Marchant, Solitary waves in nematic liquid crystals, Physica D 268, 106, 2014

[2] J. P. Borgna, P. Panayotaros, D. Rial, C. Sanchez de la Vega, Optical solitons in nematic liquid crystals: model with saturation effects, Nonlinearity 31, 1535, 2018

