Nematic liquid crystals: optimal control and numerical simulations

Constanza Sánchez F de la Vega

We study an optimal control problem for a coupled Schrödinger-elliptic evolution system that describes the propagation of a laser beam in nematic liquid crystals. We consider a bilinear control related to an electric field depending on the optical axis acting on the sample. This problem arises from the study of an optimal way to transform the input signal into a target signal by modifying a system parameter related to the bias electric field. We prove well-posedness, existence and first order necessary conditions for an optimal solution. We also give some numerical approximations of these solutions.