

Numerical Simulation of Flow in Smectic Liquid Crystals

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Abstract

Our aim is to simulate a nonlinear system of ODEs describing the flow in smectic liquid crystals. The nonlinear system is first linearized. We present a direct approach to compute the exact analytic solution of this linear system and use this solution as a starting profile in the MATLAB package `bvpsuite2.0` to obtain the approximate solution to the nonlinear system. Although, the solution of the nonlinear system has steep boundary layers and therefore is difficult to resolve, we demonstrate that `bvpsuite2.0` can cope with the problem and provide an approximation with reasonable accuracy.

References

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