



Electrical Driven Motions and Rotational Dynamics of Colloidal Platelets in Nematic Liquid Crystals

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Abstract: We study the rotational dynamics of colloidal platelets in a nematic liquid crystal under an applied electric field. The platelets exhibit a rich variety of rotational behaviors, including steady-state rotation, oscillatory rotation, and chaotic rotation. The rotational dynamics are governed by the interplay of the electric field, the nematic liquid crystal flow, and the platelet's intrinsic properties. We show that the rotational dynamics can be understood in terms of the competition between the electric field-induced torque and the nematic liquid crystal flow-induced torque. The results provide a fundamental understanding of the rotational dynamics of colloidal platelets in nematic liquid crystals and have potential applications in microfluidics and soft matter physics.

... 0, 0, 0, ... $\frac{1}{4}$ $\frac{1}{2}$, ...
Fr ... $\frac{1}{4}$ 12.1 ... $\frac{1}{4}$ 11 ...
Ab ... $\frac{1}{4}$ 5 ... $\frac{1}{4}$ $\frac{1}{2}$, ...
Fr ... $\frac{1}{4}$ 3() ...
 $\frac{1}{4}$ r ...

... Fr ... 3(), ...
(6.4) ... (4.5) ... $A >$...
... $\frac{1}{2}$ $\frac{1}{\epsilon_0}$ ϵ $\frac{1}{2}$...
... 8 ...

Fig. 3(a) shows the results of the analysis for the case of a uniform load. The results are compared with the results of the analysis for the case of a point load. The results are compared with the results of the analysis for the case of a uniform load. The results are compared with the results of the analysis for the case of a point load.

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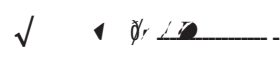
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$$41(r_{11})^2 - 15.676 - 1.159 \sqrt{D(r_{11})^9 - 6(r_{11})^{20.3314} D(r_{11}) / F5 \sqrt{2942} D(r_{11}) / F7 \sqrt{(r_{11}) - 941(r_{11}) 2934.7(r_{11}) 3954.7(r_{11}) - 32521(r_{11})}}$$

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