

Abstract Submitted
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Effect of ions on polymer ejection dynamics from viral capsids¹

ISSAM ALI, Department of Physics, College of Science, PO Box 36, Sultan Qaboos University, Al Khod 123, Oman, DAVIDE MARENDEZZO, SUPA, School of Physics, University of Edinburgh, Mayfield Road, Edinburgh, EH9 3JZ, UK, JULIA YEOMANS, Rudolph Peirls Centre for Theoretical Physics, 1 Keble Road, Oxford, OX1 3NP, UK — We present simulations investigating the impact of adding ions on the dynamics of semiflexible (DNA-like) polymers ejecting from spherical viral capsids. We find that when the DNA charge is less screened, due to, for example, the addition of monovalent ions like Na⁺, the resulting electric interactions give rise to larger ejection forces, speeding up the ejection process. The results suggest that DNA ejection can be controlled by tuning the salt concentration in the environment, in agreement with recent experiments. We also observe that the DNA structure inside the capsid changes when electrical forces are present, tending to become more spool-like.

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