Pore translocation of polymer chains with physical knots

ANTONIO SUMA, ANGELO ROSA, CRISTIAN MICHELETTI, SISSA, International School for Advanced Studies, via Bonomea 265, I-34136 Trieste, Italy — The driven translocation of knotted chains through narrow pores has important implications for single-molecule manipulation contexts. Its complex phenomenology\textsuperscript{1} is, however, still largely unexplored, both as a function of knot complexity and the magnitude of the driving, translocating force. We accordingly report on a systematic theoretical and computational investigation of both aspects. In particular we consider the case of flexible chains accommodating a large repertoire of knots that are driven through pores too narrow to allow for their passage. We show that the observed rich translocation phenomenology can be rationalised in a transparent mechanical framework that can further be used for predictive purposes\textsuperscript{2}.

\textsuperscript{2}A. Suma, A. Rosa and C. Micheletti. \textit{Pore translocation of knotted polymer chains, submitted}, 2015