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Topologically constrained polymer collapse ALEXANDER GROSBERG, University of Minnesota, THOMAS VETTOREL, KURT KREMER, Max Planck Institute for Polymer Research, Mainz, Germany — Linear polymer chains in an equilibrium melt are strongly entangled, and coils strongly overlap. Similarly, collapsed (globular) single chain is strongly self-entangled in equilibrium. It is a fundamental question of polymer physics - what happens if the formation of these entanglements or self-entanglements is either completely prohibited or strongly slowed down (like in a melt of unconcatenated rings, in a gel, etc). We address this question by massive Monte Carlo simulation based on the use of non-local moves which dramatically speed up relaxation while strictly preserving the topology. The effects of topologically supported separation of chains, or parts of the same chain, have far reaching applications ranging from gel collapse, to interphase chromosome territories, to statistics of knots in proteins.

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