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Self-organization of glass networks in a model with equilibration[1]

MARC-ANDRÉ BRIÉRE, M.V. CHUBYNSKY, NORMAND MOUSSEAU, Département de physique and RQMP, Université de Montréal — Recent experimental results suggest the existence of an intermediate phase in covalent glasses attributed to a self-organization of the glass network minimizing its internal stress. While a number of models have been proposed recently to explain this phenomenon, a full understanding of the network self-organization and the intermediate phase is lacking. We modify a previously studied model,(∗) in which a network is grown in a way that keeps it stressless, by allowing continuous equilibration as the mean coordination is increased while still avoiding stress. In our model, an unusual intermediate phase appears, in which both rigid and floppy networks have a chance to occur, a result similar to that obtained by Barré *et al.* for less realistic Bethe lattices. We discuss various structural properties of the resulting self-organized networks, as well as some results for the entropy cost of self-organization.

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