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**Compliant random fields in gels formed from side-chain liquid crystalline polymers** PAUL GOLDBART, FANGFU YE, Georgia Institute of Technology, BING LU, XIANGJUN XING, Shanghai Jiao Tong University — Localized polymer-chain backbones in gels formed from side-chain liquid crystalline polymers serve to create random fields that induce local orientational order of the nematogenic pendants of the side chains. These random fields differ, however, from conventional ones, in that they are compliant, and thus themselves undergo thermal fluctuations. We develop a free energy that describes local nematic ordering in presence of such compliant random fields. In particular, we show that, as a result of this compliance, the free energy has a qualitatively new structure, unattainable via truly static random fields. We discuss the physical implications this free energy, focusing on the consequences of the compliant nature of the random fields.

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