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Models of tensorial rheology of disordered soft materials[1]

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In recent years, the paradigm of 'soft glassy matter' has been used to describe diverse nonergodic materials exhibiting strong local disorder and slow mesoscopic rearrangements. As so far formulated, however, the resulting 'soft glassy rheology' (SGR) model treats the shear stress in isolation, effectively 'scalarizing' the stress and strain rate tensors. Here we offer generalizations of the SGR model that combine its nontrivial aging and yield properties with a tensorial structure that can be specifically adapted, for example, to the description of fluid film assemblies or disordered emulsions and foams.

[1]Work with Michael E Cates