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Anisotropic stress correlations in 2D liquids[1] BIN WU, TAKUYA IWASHITA, TAKESHI EGAMI, Univ of Tennessee, Knoxville — We demonstrate the presence of anisotropic stress correlations in the simulated 2D liquids. Whereas the temporal correlation of macroscopic shear stress is known to contribute to viscosity via the Green-Kubo formula, the general question regarding angular dependence of the spatial correlation among atomic level stresses in liquids without external shear has not been explored. Besides the apparent anisotropicity with well-defined symmetry, we found that the characteristic length of shear stress correlation depends on temperature and follows the power law, suggesting divergence around the glass transition temperature. The anisotropy of the stress correlations can be explained in terms of the inclusion model by Eshelby, based upon which we suggest that the mismatch between the atom and its nearest neighbor cage produces the atomic level stress as well as the long-range stress fields.

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