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**Dimensional dependence of mobility correlations and dynamic heterogeneity in two-dimensional and three-dimensional glass forming fluids**[1] ELIJAH FLENNER, GRZEGORZ SZAMEL, Colorado State Univ — We examine mobility correlations and heterogeneous dynamics in simulations of glass-forming two-dimensional and three-dimensional binary Lennard-Jones fluids. We compare the relationships between the dynamic correlation length $\xi_4$, the dynamics susceptibility $\chi_4$, and the alpha-relaxation time $\tau_\alpha$ by analyzing four-point structure factors $S_4(q;t)$ that are designed to investigate heterogeneous dynamics. We find that the relationships between $\xi_4$, $\chi_4$, and $\tau_\alpha$ depend strongly on dimension. Specifically, in two dimensions these relationships depend on whether the underlying dynamics is Newtonian or Brownian, but there is no dynamics dependence in three dimensions. Furthermore, in systems undergoing Newtonian dynamics $\xi_4$ grows much faster with $\tau_\alpha$ in two-dimensions than three-dimensions. Therefore, we demonstrate that dynamic heterogeneities have different properties in two and three dimensional glass forming fluids.

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