

Abstract Submitted  
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**Invariant fast surface diffusion on ultra-stable and aged molecular glasses**<sup>1</sup> YUE ZHANG, ZAHRA FAKHRAAI, University of Pennsylvania — Recent studies have reported surface diffusion on molecular glasses to be orders of magnitude faster than bulk diffusion with a lower activation barrier. The enhanced surface mobility is hypothesized to be responsible for the ultra-stable glass formation by physical vapor deposition. Here in this study, we directly measure the surface diffusion on ultra-stable glasses using tobacco mosaic virus as probe particle to test this hypothesis. Surface diffusion is also measured on physically aged and ordinary liquid-quenched glasses as a comparison. At two measuring temperatures below bulk glass transition temperature  $T_g$ , the surface diffusion coefficients remain invariant on these glasses regardless of orders of magnitude of variations in their bulk relaxation dynamics. Our results suggest that the fast surface diffusion is decoupled from the bulk relaxation dynamics when measured below  $T_g$ .

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