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**Combined Effects of Media Disorderedness and Tracer Shape on the Trend of Translation-Rotation Decoupling in Two-Dimensional Binary Colloids** YOUNGHOON OH, JEONGMIN KIM, BONG JUNE SUNG, Department of Chemistry, Sogang University, Seoul 987-654, Korea — While translational diffusion of tracers often violates the Stokes-Einstein relation, the rotational diffusion of tracers follows the Debye-Stokes-Einstein relation faithfully in the glass-forming materials. A previous study revealed that in two-dimensional (2D) monodisperse colloids, as the dynamics of media became heterogeneous in 2D hexatic phase, the tracer shape and the local media structure affected the translation-rotation decoupling trend significantly [1]: the rotation of tracers was enhanced compared to the translation for square tracers but was rather suppressed for diamond tracers. The shape dependency of rotation originated from the similarity in structure between the local hexagonal media structure and the tracer shape. Unlike in 2D monodisperse colloids where the liquid-to-hexatic phase transition takes place, in 2D binary colloids, a phase transition from the liquid to either solid or glass depends on the disorderedness that is controlled by size and number ratios. We present simulation results on the combined effects of the tracer shape and the local media disorderedness on the translation-rotation decoupling, which relates closely to the nature of glass transition. [1] J. Kim and B. J. Sung, Phys. Rev. Lett. 115, 158302 (2015)

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