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Intermediate-range order in protein suspensions YUN LIU, University of Delaware/NIST, LIONEL PORCAR, PETER FALUS, Institut Laue-Langevin, WEI-REN CHEN, Oak Ridge National Laboratory, EMILIANO FRATINI, University of Florence, KUNLUN HONG, Oak Ridge National Laboratory, PIERO BAGLIONI, University of Florence — Intermediate-range order (IRO) has been widely observed in vitreous silica, water ice, metallic glass, and even in ionic liquids. Our recent work demonstrates that there is IRO present in a colloidal suspension, such as protein solution, when both a short-range attraction and long-range repulsion are present. We have verified this experimentally using lysozyme solutions, where a peak (IRO peak) seen in small angle neutron scattering (SANS) has been mistakenly called a cluster peak as it has once been considered an indication of a cluster rich phase in solution. By combining both SANS and neutron spin echo (NSE) techniques, we clearly show that there is no direct relation between cluster formation and the presence of an IRO peak. By investigating the short time dynamics using NSE, we show that the formation of clusters is still indeed possible at high concentrations.

Yun Liu
University of Delaware/NIST

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