Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Chemical ordering in Cu-Zr and Cu-Hf liquids and glasses NICHOLAS MAURO, ADAM VOGT, MATT BLODGETT, JAMES BENDERT, KENNETH KELTON, Washington University, WASHINGTON UNIVERSITY DEPARTMENT OF PHYSICS TEAM — Evidence for chemical ordering in Cu-Zr and Cu-Hf metallic liquids and glasses is presented. High-energy X-ray diffraction data has been taking using the Beamline Electrostatic (BESL) technique and stationary scattering methods up to a high momentum transfer. From this data, we obtained the total pair-correlation functions. By examining the structural evolution in the equilibrium and undercooled liquid, and the glassy state, we find that ordering occurs, increasing the Cu-Zr (Cu-Hf) and Zr-Zr (Hf-Hf) correlations over a wide composition and temperature range. This ordering is evident by a judicious choice of scattering lengths and compositions. Growth is observed at two distinct r-space coordinates in the pair-correlation function, unique to these two metallic systems. These results will be discussed in the context of previous experiments which indicate that this ordering is chemical and topological in nature, likely due to the development of Cu-centered icosahedral clusters.

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Date submitted: 31 Oct 2011 Electronic form version 1.4