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Measurements of Dynamically Compressed Liquid Structure beyond 3 Mbar Using X-Ray Diffraction AMY L COLEMAN, RICHARD BRIGGS, FEDERICA COPPARI, AMALIA FERNANDEZ-PANELLA, MARTIN G GORMAN, RAY F SMITH, Lawrence Livermore Natl Lab, SALLY J TRACY, Carnegie Institution for Science, Geophysical Laboratory, JON H EGGERT, DAYNE E FRATANDUONO, Lawrence Livermore Natl Lab — The study of liquid structures at high-energy densities is an important field that has long been impeded by experimental limitations. Static diamond anvil cell techniques have traditionally been used to determine liquid structures at high-P but are limited by small sample sizes and large background contributions. Dynamic compression presents an alternative approach. As well as providing access to P and T states that are not accessible using static compression methods, the sample package does not include mm-thick diamonds that contribute to large backgrounds. Here we present some of the first liquid structures, shock compressed to beyond 3 Mbar, obtained at the Dynamic Compression Sector (DCS), of the Advanced Photon Source. The liquid structure factors of several metallic elements have been determined using procedures established by the static community and are presented here as well as a discussion of the challenges associated with this type of research. (This work was performed under the auspices of the US Department of Energy by Lawrence Livermore National Laboratory under Contract No. DE-AC52-07NA27344)

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