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Beamline 8-ID: A Dedicated Undulator Beamline for Performing Small-Angle X-Ray Photon Correlation Studies of Bulk Materials and Thin Films. A.R. Sandy, S. Narayanan, The Advanced Photon Source, Argonne National Laboratory, Argonne, IL 60439 USA; X. Jiao, L.B. Lurio, Dept. of Physics, Northern Illinois Univ., DeKalb, Illinois 60115 USA, S.G.J. Mochrie, Dept. of Applied Physics, Yale Univ., New Haven CT 06520.

X-Ray Photon Correlation Spectroscopy (XPCS), the x-ray analog of dynamic light scattering, probes sample dynamics in a range of wave-vector and frequency space that is generally inaccessible to other light- and neutron-scattering techniques. XPCS experiments are performed by illuminating the sample under study with a coherent beam so that the scattered x-rays produce a speckle pattern. Time auto-correlation of the speckle pattern yields the characteristic decay time(s) of the sample. We have implemented a dedicated instrument for performing XPCS at Beamline 8-ID at the Advanced Photon Source, Argonne National Laboratory. Beamline 8-ID has successfully performed nanoscale dynamics measurements of polymer melts, polymer-nanoparticle composites and aging gels. Recently, our XPCS capabilities have been extended to the regime of thin films via the implementation of a dedicated sample reflectometer. The new instrument has been used to probe the dynamics of polymer films in the near-surface region and at buried interfaces.