Abstract Submitted
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Probing buried interfaces by Index-Matched Soft X-ray Scattering[1] E. GANN, J. SEOK, NCSU, J. COCHRAN, M. CHABINYC, UCSB, B. COLLINS, H. ADE, NCSU — Interfaces are often critical to function and performance in systems ranging from electronics to biology. Organic-organic interfaces are the location for charge transport in organic thin film transistors and exciton splitting in organic photovoltaics. Complete morphological characterization of buried interfaces is unfortunately difficult to achieve with conventional tools. We present a new method termed Index-Matched Soft X-ray Scattering (IM-SoXS). By matching the real part of the complex index of refraction of the top layer to that of vacuum through judicious choice of photon energy, we can minimize scatter from the top surface and substantially increase scatter from a buried interface, revealing both the spatial distribution and amplitude of the interfacial roughness. We demonstrate the method on samples with engineered and controlled interfacial roughness and provide examples of systems of scientific interest for which IM-SoXS should provide improved understanding of interface morphology and its relation to performance and function in systems.

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