

Abstract Submitted  
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**Optimal conditions for combining a transmission x-ray microscope with a grating interferometer**<sup>1</sup> XIANGHUI XIAO, QUN SHEN, Argonne National Laboratory, X-RAY MICROSCOPY & IMAGING GROUP TEAM — Transmission x-ray microscope (TXM) is a powerful imaging tool that can provide resolution down to 15~20 nm. Grating interferometer (GI) is a recently established imaging technique with which both phase and attenuation information of an arbitrary specimen can be extracted in a straightforward way. The achievable resolution of a GI is limited by either the grating analyzer period or the detector pixel size, which is currently at about micron level. It is natural to imagine that combining a TXM with a GI (TXMGI) will give ability to image a weak-absorbing specimen with high resolution. However, it is not trivial to obtain reliable structure information from a TXMGI. In this presentation, we will discuss the dependence of the interferogram on three key parameters in a TXMGI, i.e. the coherence of the illumination beam, the numerical aperture of the TXM, and the grating period. Based on that result, the optimal conditions and the limits on the achievable resolution are obtained.

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Xianghui Xiao  
Argonne National Laboratory

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