Performance evaluation of the IXS analyzer at the NSLS-II 10-ID beamline.

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NSLS-II meV-IXS spectrometer has a unique design aimed at studying dynamics in soft and hard matter with medium energy x-rays [1]. Its analyzer scheme is based on the combination of a post-sample collimating mirror and highly asymmetric crystal optics to deliver ~meV resolution with high spectral contrast for inelastic x-ray scattering. As a pioneering facility in the construction and operation of such a unique meV-IXS spectrometer, we have gained exceptional experience and detailed knowledge in optimizing and operating our spectrometer. In my presentation, I will demonstrate a detailed analysis of the performance of the analyzer optics based on theoretical computation and comparison with experimental observations. I will also provide the basis for potential future improvements of the analyzer.

[1] Y.Q. Cai, D.S. Coburn, A. Cunsolo, J.W. Keister, M.G. Honnicke, X.R. Huang, C.N. Kodituwakku, Y. Stetsko, A. Suvorov, N. Hiraoka, K.D. Tsuei, and H.C. Wille, "The ultrahigh resolution IXS beamline of NSLS-II: Recent advances and scientific opportunities", Journal of Physics: Conference Series 425, 202001 (2013)