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Development of a 10 nm spatial resolution Hard X-ray Microscope for the Nanoprobe beamline at NSLS-II EVGENY NAZARETSKI, HANFEI YAN, JUNGDAE KIM[1], KENNETH LAUER, KAZIMIERZ GOFRON, Brookhaven National Laboratory, DEMING SHU, Argonne National Laboratory, YONG CHU, Brookhaven National Laboratory — We present recent progress on the development of an x-ray microscope for the Hard X-ray Nanoprobe (HXN) beamline at NSLS-II. We discuss design approach suitable for achieving sub-10 nm spatial resolution x-ray fluorescence and diffraction measurements. Different types of focusing optics e.g. Multilayer Laue Lenses (MLL) and Zone Plates (ZP) will be implemented in the microscope yielding diverse scientific applications for the targeted spatial resolutions of 10 nm and 30 nm respectively. We discuss modular design of the microscope that enables multi-functionality and includes the possibility to regulate temperature at the sample location. The design of the microscope is greatly based on our in-depth evaluation of numerous commercially available components; detailed studies of their performance in terms of mechanical stability, resolution, and thermal characteristics. Also, our design approach greatly relies on extensive experience acquired during construction and subsequent using of a prototype scanning MLL-based microscope.

[1]Present address: Department of Physics, University of Ulsan, Ulsan 680-749, Korea

Evgeny Nazaretski
Brookhaven National Laboratory

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