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Beyond 5 nm: high resolution in low energy photoemission electron microscopy through variable spherical and chromatic aberration correction[1] J.P.S. FITZGERALD, R.C. WORD, R. KOENENKAMP, Portland State University — Correcting spherical and chromatic aberration in electron optics remains a fundamental obstacle to high resolution microscopy. This is particularly true for low energy photoemission electron microscopy (PEEM) in which electrons are emitted with a wide range of energies, demanding greater chromatic aberration correction. Based on the success of a simple electrostatic hyperbolic mirror, we are developing a multi-electrode mirror that will provide variable chromatic and spherical aberration correction. Following the same hyperbolic geometry allows analytic solutions for the spherical and chromatic aberration coefficients, allowing the optimization of other geometric parameters. The final, optimized design was compared against simulation and found to differ by less than 5% over the operating voltage ranges. We are currently working on installation of this new correction system and report on progress.

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