Figuring by Multilayer Deposition: A New Technique for Producing Ultraprecision Optics

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The development of multilayer reflective EUV optics has produced a capability for the deposition of thin films having subnanometer roughness and thickness errors. We have begun to apply this capability to correct small figure errors in optical components. By deposition of a corrective Co/C multilayer through an appropriately designed mask, we have reduced the radial errors in a test optic by an order of magnitude without adding any roughness to the surface. We will discuss present limitations of the technique and the extension to general 2-D corrections of a surface.