



*Challenges and solutions for the interferometric measurement of aspherical and freeform optics*

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Interferometers are most accurate when the comparison between the test and reference wavefronts approaches a null test. Consequently, aspherical or freeform surfaces presents significant challenges. Here we consider solutions based on techniques that minimize local slope by means of a sequence of data acquisitions with the object in different positions or orientations. A first approach involves axial scanning through a series of annular fields or measurement zones, where the measured diameter of these zones together with the known axial position provides sufficient information for determining aspheric form. A second approach involves measurement of local surface shape and fine-scale roughness using interference microscopy, followed by software correlation of the high spatial-frequency microstructure to lock together successive measurement fields independent of stage motion. The presentation includes examples of “lessons learned” about asphere and freeform fabrication from detailed interferometric measurements of form and surface texture.

**SHORT BIO:**

Dr. Peter de Groot is the Executive Director of R&D at Zygo Corporation, where he manages and contributes to innovation and new product discovery. He is also an Honorary Professor at the University of Nottingham, and an active member of the Applied Optics community as a lecturer and author.