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Size Scaling of Protein Sensitivity on the BioCD[1] KEVIN O'BRIEN, MING ZHAO, XUEFANG WANG, DAVID NOLTE, Purdue University — We investigate size scaling of the surface-height sensitivity of spinning-disk interferometry (SDI) implemented on the in-line-quadrature BioCD as a function of laser focal radius. The in-line-quadrature BioCD consists of a silicon wafer with a 120 nm layer of silicon dioxide that creates a quadrature condition between the incident and reflected light. When a laser beam is focused on the BioCD, proteins printed on the silicon dioxide substrate create a phase shift leading to quadrature interference, which is detectable in the far field as an intensity shift. The purpose of this scaling experiment is to determine the practical and fundamental limits on the sensitivity of the BioCD, and how those limits change as a function of the size of the focal spot. We imaged a single 100 micron wide protein spot with focal spot sizes of 1, 5 and 10 microns and observe a square-root scaling as a function of the number of pixels per protein spot.

[1]NSF REU Program

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