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Observations of Anisotropy in Atmospheric Turbulence by Means of Moiré Deflectometry SAIFOLLAH RASOULI, M.D. NIRY, Y. RAJABI, A.A. PANAHI, Department of Physics, Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan 45137-66731, Iran, J.J. NIEMELA, The Abdus Salam ICTP — We report observations of strong anisotropy in the statistical properties of atmospheric turbulence, using a method based on moiré deflectometry. By combining use of a telescope with moiré deflectometry we achieve a high sensitivity to fluctuations in the wave-front phase, which are, in turn, related to fluctuations in the fluid density. As phase fluctuations of the wave front in the aperature of the telescope are imaged on the first grating of the moiré deflectometer, a high spatial resolution is achieved. Experimentally, we measure covariance of angle of arrival (AA) between pairs of points displaced spatially on the telescope aperature and find significant differences between scaling exponents derived for covariances in the longitunal and transverse directions. We note that the method does not require the use of the Taylor hypothesis and has the advantage of being relatively simple and inexpensive.

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