

Abstract Submitted
for the CAL13 Meeting of
The American Physical Society

Reconstructing the surface-height autocorrelation function of a randomly rough dielectric surface using incoherently scattered light
SANGEETA CHAKRABARTI, ALEXEI MARADUDIN, Department of Physics and Astronomy, University of California Irvine — We present an analytic approach for obtaining the normalized surface height autocorrelation function of a one-dimensional randomly rough dielectric surface from experimental scattering data. It is based on the contribution to the mean differential reflection coefficient, obtained in the Kirchhoff approximation, from the light scattered incoherently. The incident light is s polarized, and its plane of incidence is perpendicular to the generators of the surface. Good agreement with numerically generated experimental data was obtained. We present several examples illustrating our approach for different power spectra and surface parameters. This approach can be used to determine the rms height, transverse correlation length and the dielectric constant of a one-dimensional randomly rough surface by inverting the incoherent contribution to the mean differential reflection coefficient.

Alexei Maradudin
Department of Physics and Astronomy, University of California Irvine

Date submitted: 07 Oct 2013

Electronic form version 1.4