High Resolution X-Ray Scattering Characterization Of Various Surfaces Relevant For Multilayers And Thin Film Coatings

Salim Abdali, Finn E. Christensen and Allan Hornstrup
Danish Space Research Institute, Gl. Lundtoftevej 7, 2800 Lyngby, Denmark
e-mail: salim@dsri.dk

Different substrates and thin film surfaces were analysed utilizing two high resolution x-ray scattering setups. In these Cu-Ka (8.05 keV) setups a resolution of 15 Arcsec and 4.5 Arcsec were achieved, employing channel cut single crystals with 3 and 5 reflections, respectively. The samples were; three different silicon single crystals, two different sides of float glass, thin glass of different thicknesses (0.05mm-0.2mm), thin gold film on lacquered luminium foil and an epoxy replicated Au-film, likewise on an aluminuim foil. Roughness and correlation length were deduced from these measurements, which were carried out in the total reflection region, below the critical angle.