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Thickness and roughness measurements of nano thin films by interference fringe intensity curve

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Abstract

In the standard optical interference fringes approach, by measuring shift of the interference fringes due to step edge of thin film on substrate, thickness of the layer has already been measured. In order to improve the measurement precision of this popular method, the interference fringes intensity curve was extracted and analyzed before and after the step preparation. By this method, one can measure a few nanometers films thickness. In addition, using the interference fringes intensity curve and its fluctuations, the roughness of surface is measured within a few nanometers accuracy. Comparison of our results with some direct methods of thickness and roughness measurements, i.e. using surface profilometer and atomic force microscopy confirms the accuracy of the suggested improvements.

Keywords: nano layers, thickness measurement, roughness, optical interference

For full article, refer to the Persian section.