影像式橢圓偏光儀在曲面薄膜量測

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摘　要

簡式影像橢圓偏光術是由偏光片、樣品及析光片所組成量測面的橢圓偏光參數之技術。此法只需量測三個析光片方位角之亮度即可量取樣品的橢圓偏光參數 (Ψ、Δ) 及偏光片的方位角誤差。此方位角誤差已證明為入射角的偏差，故可用以量測曲面的橢圓偏光參數。本實驗室已可由數值計算中將橢圓參數 Ψ、Δ 修正回不受偏光片與析光片方位角誤差影響。在本文中我們將利用 α 來判斷曲面結構，並推算在此結構的入射角分佈，再利用此入射角分佈與實驗所得橢圓參數 Ψ、Δ 配合計算待測曲面薄膜的厚度分佈。

The Ellipsometric Measurements of a Curved Surface

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Abstract

This work presents a three-intensity measurement technique to determine the ellipsometric parameters (Ψ,Δ) of a curved surface in a polarizer–sample-analyzer (PSA) imaging ellipsometry. After a careful calibration on the azimuth position of the water-surface, we can prove that the azimuth deviation of polarizer is caused by the local surface normal; thus, we not only can determine the radius curvature of the curved surface, we also can correct its incident-angle from the measurement. Moreover, utilizing the ellipsometric parameters, we can calculate the thickness of the thin film coated on a curved surface.