3D Thin-film Thickness Profile Measurement of Multilayer Films
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With the growth of 3D packaging technology and the development of flexible, transparent electrodes, the use of multilayer thin-films is steadily increasing throughout high-tech industries including semiconductor, flat panel display, and solar photovoltaic industries. Also, this in turn leads to an increase in industrial demands for inspection of internal analysis. However, there still remain many technical limitations to overcome for measurement of the internal structure of the specimen without damage. In this presentation, we propose a new approach that goes one step further than conventional methods, which provides simultaneous measurement of the film surface and thickness by computing the absolute reflectance and phase over a wide range of wavelengths. We also use the iterative least-square phase-shifting algorithm for precise measurement of the broadband phase spectra by suppressing critical phase shift errors, and it provides a better solution for multilayer film metrology. In the near future, it is anticipated that our proposed technique will be widespread as a more general metrological tool for 3D inspection of multilayer film structure.