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Title:High-throughput characterization of film thickness in thin film materials libraries by digital holographic microscopy

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Abstract:A high-throughput characterization technique based on digital holography for mapping film thickness in thin-film materials libraries was developed. Digital holographic microscopy is used for fully automatic measurements of the thickness of patterned films with nanometer resolution. The method has several significant advantages over conventional stylus profilometry: it is contactless and fast, substrate bending is compensated, and the experimental setup is simple. Patterned films prepared by different combinatorial thin-film approaches were characterized to investigate and demonstrate this method. The results show that this technique is valuable for the quick, reliable and high-throughput determination of the film thickness distribution in combinatorial materials research. Importantly, it can also be applied to thin films that have been structured by shadow masking.

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