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## Advances in metrology of three-dimension cross scale of micro-structure

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Micro structures act as sensitive form for many type sensors, which are widely used in the fields of MEMS, Trace Component Analysis(TCA), Semiconductor packaging, Cooling parts and optical inspect of small target, et al., In current time, micro structures show cross scale topology in three dimensions. First is along vertical direction, shows shallow surface in scale of several hundred nanometers or deep structure in several hundred micrometers with high aspect ratio. Second is distribution in transverse direction with several millimeters. In the past, the form parameters of microstructure were usually tested by scanning electronical microscopy (SEM), but needs preparation of cutting sample, that is not suit to optimize the procession parameter. The low coherence microscopic or wide-field interferometer is the non-destructive instrument of microstructure tomography. In this presentation, we talk about the feature of low coherence microscopic interferometer, advances in several type of instrument used to measure different kinds of microstructure, for example surface microstructure with height near to working wavelength[1] and high aspect ratio microstructure[2]. We also talk about advance in low coherence interferometer with big field of view.

### References

1. Yang, Z; Gao, Z. *et al.*, OPT. AND LAS. IN ENGIN. **145**, 0143-8166 (2021).
2. Ma J, Qun Y, Gao Z., et al. *Acs photonics*, **11(3)**: 1068-1077(2024).

**Short Bio:**



**Zhishan Gao** received his M.S. in optics from Changchun Institute of Optics and Fine Mechanics (CIOMP) in 1992, and Ph. D. in optical engineering from Nanjing University of Science and Technology (NJUST) in 2000. He was a senior visiting scholar at University of Stuttgart, Germany, and Virginia Polytechnic Institute and State University, USA, in 2008 and 2015, respectively. He currently is a full Professor and leader of group of advanced optical design and precision optical instrument (AODPI) at NJUST with the department of Optical Engineering. His current research interests include optical design, and optical metrology. et al. He is a member of a council of the Chinese Optical Society (COS). He was awarded Wang Daheng’s Optical Prize of the COS to commend and encourage his outstanding contribution made in optical science and technology in 2007.