Modeling of advanced optical surfaces with localized and segmented approaches

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Nowadays, advanced optical surfaces with functional micro-/nanostructures on top find their applications in various cases, such as diffractive-/metasurfaces for light manipulation, photomasks and surfaces with complex coatings for lithography, etc. Surfaces with fine structures comparable to the wavelength must be simulated with electromagnetic-field-based solvers so to include the effects like diffraction and polarization. But the high computational complexity of rigorous electromagnetic solvers strongly limited their application within the size of only tens (3D) or hundreds (2D) of wavelengths, despite of the rapid development of high-performance computing technologies. We discuss the modeling of advanced optical surfaces with high diameter-feature ratio and aim to find good balance between accuracy and efficiency by introducing localized and segmented approaches for selected applications.

Short Bio:

Site Zhang obtained his PhD in 2018 from Friedrich Schiller University Jena, Germany. He was the chief technology officer at LightTrans International UG from 2018 to 2021, and then joined Changchun Institute of Optics, Fine Mechanics and Physics (CIOMP), Chinese Academy of Sciences (CAS) as a professor. Now he is the deputy director of the Key Laboratory of Advanced Manufacturing for Optical Systems (KLAMOS), CAS.