Dispersion-engineered Metasurface Components

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Optical dispersion results from the index of refraction of a material varying with the frequency of incident light. Accurate control over this property is crucial in numerous industrial and research applications. For example, it mitigates pulse spreading in optical fibers, which are the backbone of modern telecommunications, enables pulse compression in ultrafast laser optics (2018 Nobel Prize in Physics), and ensures faithful image reproduction in imaging systems by reducing chromatic aberrations. By customizing the geometric parameters of the constituent nanostructures, metasurfaces provide a disruptive way to control dispersion [1]. Specifically, metasurface provides a unique way to control phase, group delay and group delay dispersion. This spurs widespread applications and, in this talk, I will show dispersion-engieered metasurface components for achromatic imaging[2, 3], broadband aberration correction [4] and aberration-corrected spectrometer [5].

References

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