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[952] Structured matter based ultrasound sensing

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Metamaterials are artificially structured materials designed to exhibit extraordinary physical properties not found in nature. They have been utilized for a wide range of applications such as beam shaping, lensing, and microscopy. In recent years, metamaterials have also been explored for their potential in refractive index sensing. A metasurface-based ultrasound sensor can provide high flexibility, sensitivity, resolution, and versatility, making it a promising candidate for various applications, including medical imaging and non-destructive testing. We design and study optical metasurfaces to be utilized as ultrasound wave sensors, demonstrating the potential of metamaterials in multimodal all-optical ultrasound sensing.

Theoretical Work

Author: BRANDMÜLLER, Dorian (Institute of Physics, University of Graz)

Co-authors: Prof. BANZER, Peter (Institute of Physics, University of Graz; Christian-Doppler Laboratory for Structured Matter Based Sensing, Institute of Physics, University of Graz); Dr NUSTER, Robert (Institute of Physics, University of Graz)

Presenter: BRANDMÜLLER, Dorian (Institute of Physics, University of Graz)

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