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Electron density and effective atomic number ($\mathbf{Z}_{\text{eff}}$) determination through x-ray Moiré deflectometry[1] MARIA PIA VALDIVIA LEIVA, DAN STUTMAN, MICHAEL FINKENTHAL, JHU — Talbot-Lau based Moiré deflectometry is a powerful density diagnostic capable of delivering refraction information and attenuation from a single image, through the accurate detection of X-ray phase-shift and intensity. The technique is able to accurately measure both the real part of the index of refraction δ (directly related to electron density) and the attenuation coefficient μ of an object placed in the x-ray beam. Since the atomic number Z (or Zeff for a composite sample) is proportional to these quantities, an elemental map of the effective atomic number can be obtained with the ratio of the phase and the absorption image. The determination of Zeff from refraction and attenuation measurements with Moiré deflectometry could be of high interest in various fields of HED research such as shocked materials and ICF experiments as Zeff is linked, by definition, to the x-ray absorption properties of a specific material.

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