# Quantitative disentanglement of coherent and incoherent laser-induced surface deformations by time-resolved x-ray reflectivity

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Abstract:

We present time-resolved x-ray reflectivity measurements on laser excited coherent and incoherent surface deformations of thin metallic films. Based on a kinematical diffraction model, we derive the surface amplitude from the diffracted x-ray intensity and resolve transient surface excursions with sub-Angstrom spatial precision and 70 ps temporal resolution. The novel analysis allows for decomposition of the surface amplitude into multiple coherent acoustic modes and a substantial contribution from incoherent phonons which constitute the sample heating.

Coments:

A second paper about coherent acoustic surface modes in anisotropic elastic media is under preparation.