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【706】THz/x-ray pump-probe experiments on metal catalyst surfaces

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Tuneable THz radiation could be used to selectively excite low-frequency substrate-molecule modes relevant to the catalytic activity. Probing of such motion requires a technique with high structural sensitivity and temporal resolution, such as photoelectron diffraction. Metallic catalyst surfaces strongly modify the electric field of the pump pulse due to dielectric screening. Here we present a pump-probe study of the effective field on Pt(111) thin films exposed to THz radiation. The experiments were carried out at the FLASH (DESY, Hamburg). Photoelectrons emitted by an ultrashort (<80 fs) x-ray pulse were subject to streaking by the THz pulse. Recording all electron momentum components allowed for complete field reconstruction, where we could find distinctive differences between bulk metal and thin film surfaces.

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