



Contribution ID: 376

Type: **Poster**

【176】 Photo-induced structural dynamics in Magnetite

Tuesday 31 August 2021 19:05 (1 minute)

Magnetite (Fe_3O_4) is the first magnetic material ever discovered. At 125K, the system undergoes a metal-insulator transition (MIT) accompanied by a structural transition as well as a magnetic rearrangement, the so-called Verwey transition.

Light offers the appealing possibility of manipulating the electronic and structural properties of matter. Here, using two different photon-energies, we directly visualize the photo-induced structural dynamics of Magnetite using the ultrafast electron diffraction (UED) technique providing sub pm/ps spatio-temporal resolution. We found two distinct behaviors that could be explained by different interactions between the electronic/magnetic degrees of freedom and the crystal structure.

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Session Classification: Poster Session

Track Classification: Condensed Matter Physics (KOND)