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Charge Density Waves Formation in $1T\text{-TiSe}_2$ Based on Pump-Probe Femtosecond Electron Diffraction

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Abstract content
 (Max 300 words)
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$1T\text{-TiSe}_2$ is an inorganic crystal that has been studied for almost four decades as systems with strong electron-electron and electron-phonon correlations. The main attraction to this family of compound is its potential to exhibit a ground state phenomenon known as charge density waves (CDWs) whose detailed physical origin has not been controversially undetermined.

We shall be using an ultrafast femtosecond laser based on pump-probe technique, namely ultrafast electron diffraction, to investigate some of the noble features associated with this crystal.

A pump laser pulse excites the crystal from its ground state and the probe pulse (ultrashort electron pulse) takes the snapshot of this evolution of the lattice generating an electron diffraction pattern of the crystal. Hence the dynamical structural behaviour can be observed in time with a subpicosecond temporal resolution. Temperature increase in the crystal due to pump laser shall be characterised.

Time-resolved measurements targeting the behaviour of the associated features shall be investigated as well as characterised. The suppression of the charge density wave order, electron-phonon coupling time, and the CDW recovery processes shall be determined.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD)?

MSc

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

No

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