

Determination of the soft-phonon mode in a candidate material for the excitonic phase

Ta_2NiSe_5 has attracted significant attention as a candidate material for the excitonic phase. Dr Ryosuke Kurihara in the Tokunaga group has performed ultrasonic measurements on a single crystal of $(\text{Ta}_{0.952}\text{V}_{0.048})_2\text{NiSe}_5$, which was successfully enlarged by partial chemical substitution. The results exhibit a considerable decrease of the elastic constants of C_{55} by more than 90% toward the transition temperature, which indicates that softening of the B_{2g} transverse acoustic phonon plays a crucial role in this transition. Further studies on the search for the coherence peak in the ultrasonic absorption coefficient that characterize the excitonic phase and the magnetic field effect verification on this transition are in progress.

Please check the following reference for details.

R. Kurihara *et al.* “Elastic Soft Mode and Electric Quadrupole Response in Excitonic Insulator

Candidate $(\text{Ta}_{0.952}\text{V}_{0.048})_2\text{NiSe}_5$: Contribution of Electron–Phonon Interaction”, J. Phys. Soc. Jpn. **91**, 024601/1-7 (2022).

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