Contribution ID: **61** Type: **Oral**

Uniaxial Pressure Control of Charge Density Wave in ScV6Sn6

Tuesday, 7 October 2025 15:30 (20 minutes)

Uniaxial Pressure Control of Charge Density Wave in ScV6Sn6

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ScV6Sn6 is a bi-layer Kagome system in which the structural degrees of freedom in the out-of-plane direction are suggested to play a major role in the stabilization of the charge density wave (CDW) order [1-3]. Here, we investigate the effects of uniaxial pressure along the c axis in this material. Our electrical resistivity measurements under c-axis uniaxial stress reveal a fast suppression of the CDW transition followed by a change in the CDW character at 0.9 GPa. In contrast, our x-ray diffraction measurements show that at near-zero stress, CDW reflections are initially enhanced by c-axis compression, with suppression occurring beyond 0.05 GPa. Our findings highlight the importance of the c-axis lattice parameter for the tuning and stabilization of the CDW order in this material.

1. W. S. Arachchige, W. R. Meier, M. Marshall, T. Matsuoka, R. Xue, M. A. McGuire, R. P. Hermann, H. Cao, and D. Mandrus, Charge Density Wave in Kagome Lattice Intermetallic ScV6Sn6, Phys. Rev. Lett. 129, 216402 (2022).
2. K. Wang, S. Chen, S.-W. Kim, and B. Monserrat, Origin of competing charge density waves in Kagome metal ScV6Sn6, Nat. Commun. 15, 10428 (2024).
3. G. Pokharel, B. R. Ortiz, L. Kautzsch, S. J. Gomez Alvarado, K. Mallayya, G. Wu, E.-A. Kim, J. P. C. Ruff, S. Sarker, and S. D. Wilson, Frustrated Charge Order and Cooperative Distortions in ScV6Sn6, Phys. Rev. Materials 7, 104201 (2023).

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Session Classification: Talks Tuesday Afternoon