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Multi-Gap Superconductivity in Chevrel Phases ALEXANDER PETROVIC, CEDRIC DUBOIS, GILLES SANTI, CHRISTOPHE BERTHOD, OYSTEIN FISCHER, DPMC-MaNEP, University of Geneva, Switzerland, ROLF LORTZ, Department of Physics, Hong Kong University of Science and Technology, Hong Kong, ALBIN DEMUER, ARLEI ANTUNES, ANTOINE PARE, Grenoble High Magnetic Field Laboratory, CNRS Grenoble, France, DIALA SALLOUM, PATRICK GOUGEON, MICHEL POTEL, Department of Chemistry, University of Rennes, France — Sub-Kelvin scanning tunnelling spectroscopy (STS) in the quasi-3D Chevrel Phases $PbMo_6S_8$ and $SnMo_6S_8$ reveals two distinct superconducting gaps at $\sim$ 3meV and $\sim$ 1meV. The relative spectral contribution from each gap changes with the angle between tip and sample, implying a rather anisotropic Fermi surface. Complementary to our local probe studies, specific heat measurements confirm the strong coupling ($2\Delta/k_BT_c \sim 4.9$) seen by STS in each material and provide further evidence for multi-gap superconductivity. Hexagonal vortex lattices have been imaged by STS for each compound, with vortex core spectroscopy indicating a pseudogap within the cores. No pseudogap is visible in normal-state spectra, suggesting that the gapped vortex cores may be a novel consequence of two-band superconductivity.

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