

Abstract Submitted  
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**Anisotropic electronic structure of ReS<sub>2</sub>** D. BISWAS, J. M. RILEY, L. BAWDEN, O. J. CLARK, L. COLLINS-MCINTYRE, J. FENG, Univ of St Andrews, W. MEEVASANA, Suranaree Univ of Technology, R. YANO, T. SASAGAWA, Tokyo Inst of Technology, A. GANOSE, D. O. SCANLON, Univ College London, P. D. C. KING, Univ of St Andrews — The recent discovery that the optical properties of the group VIIB transition metal dichalcogenides (TMDCs), ReX<sub>2</sub> (X=Se,S) depend only weakly on material thickness has opened the possibility to achieve optical response from bulk ReX<sub>2</sub> which can only be realised by fabrication of single-layer samples in group VIB semiconducting TMDCs such as MoS<sub>2</sub> and WSe<sub>2</sub> [1]. While anisotropy in the optical and electronic properties of ReX<sub>2</sub> has been extensively studied, the electronic structure which underpins this remains almost completely unexplored experimentally to date. We present direct measurements of the electronic structure of ReS<sub>2</sub> from angle resolved photoelectron spectroscopy. Through this, we uncover an intriguing energy dependence of the underlying electronic structure anisotropy. Particularly we find that the states at the valence band top are rather three dimensional, with the fundamental band gap located away from the Brillouin zone centre. At higher binding energies, the electronic bands become quasi one-dimensional, reflecting the Re chains which form due to a pronounced structural distortion in ReS<sub>2</sub>. [1] S. Tongay, *et. al.*, Nat. Commun. **5**, 3252 (2014).

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