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STM study on the structures of SnSe surfaces[1] TAE HOON KIM, SANG-UI KIM, TRINH THI LY, ANH TUAN DUONG, SUNGLAE CHO, Department of Physics, EHSRC, and BRL, Univ of Ulsan, S. H. RHIM, Department of Physics and EHSRC, Univ of Ulsan, JUNGDAE KIM, Department of Physics, EHSRC, and BRL, Univ of Ulsan — SnSe is a 2 dimensional layered material, and each layer is coupled by van deer Waals forces allowing very easy cleaving though the layer surfaces. SnSe has been studied for various potential applications because of its high stability and elemental abundance in earth. Recently, it was also reported that bulk SnSe has an excellent thermoelectric property of ZT=2.6 at 923 K along the b axis (Zhao et al, Nature 508 373 (2014)). The surface of a single crystal SnSe was studied via a home-built low temperature scanning tunneling microscopy (STM). Clear atomic images of SnSe surfaces were observed at the filled and empty state measurements, and detail atomic structures were analyzed by comparing with DFT simulations. We found that the atomic image of SnSe surfaces measured by STM is not trivial to understand. Only Sn atoms were visible on STM topographic images for the both of filled and empty state probing.

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