

Abstract Submitted  
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**The tunneling spectra and superconducting gaps observed by using scanning tunneling microscopy near the (100)/(110) grain-boundary of FeSe<sub>0.5</sub>Te<sub>0.5</sub> films** KUANG CHENG LIN, YOU-SHENG LI, CHENG-CHUNG CHI, National Tsing Hua University, NATIONAL TSING HUA UNIVERSITY TEAM — We have found that, using PLD method, the a- and b-axis of the FeSe<sub>0.5</sub>Te<sub>0.5</sub> film deposited on pristine MgO substrate are parallel to those of MgO, while these axes of the film grown on MgO substrate treated with Ar-ion milling rotate 45° along its c-axis. Here, we prepared such film with two kinds of orientations (0° and 45° ab plane with respect to the substrate axis) on MgO substrate with the connection between them form a ramp at an angle about 30° to the substrate plane. We used STM to study the tunneling spectra of two orientations of c-axis planes and the connection ramp between them. In the planar region with different orientation, we have observed similar tunneling spectra with a superconducting gap about 5 meV. This gap value is consistent with the previous studies of a variety of FeSeTe samples. However, a much larger gap about 18 meV is observed in the ramp region. The only paper we found to have such a large gap in the family of Fe-based superconductors is the one by Xue et.al. They have shown a gap of 20 meV in one unit-cell thick of FeSe on STO substrate. Furthermore, we have also observed a small ZBCP inside the large gap at 4.3K. The ZBCP becomes smaller with increasing temperature and disappears near and above TC.

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