

We thank the reviewers for their time and efforts. Below we provide further clarification of the remarks raised by the reviewers

Reviewer #1 (Remarks to the Author):

Manuscript Summary:

The manuscript reports on a uniaxial strain device integrated to the STM instrument. The effect of the uniaxial strain is clearly observed. And the protocol and uniaxial strain devices are clearly discussed.

Minor Concerns:

The manuscript is lacking a description how they make the tip spin-polarized. Is there something special about how they interact the tip with the Fe surface to pick up those atoms for SP-STM? The layout of figures 7,8 is difficult to follow. Maybe clear boundaries around the collated figures could help the reader.

To achieve spin-polarized STM, the last atoms of the STM tip has to be coated with magnetic atoms, which can be quite challenging. In this case of studying Fe_{1+y}Te , the sample itself provides a simple means of achieving this. The excess irons (y concentration in Fe_{1+y}Te) are weakly bound on the cleaved surface. Scanning the tip at low bias and with high enough current exceeding a few nA brings the tip in close proximity to these Fe atoms and a few of those atoms can be picked up by the tip. Successful preparation of a spin polarized tip is revealed by the magnetic contrast in the topography whose periodicity is twice that of the lattice constant of top tellurium atoms. This additional modulation is the antiferromagnetic order in the sample.

We have added a section on how we made our tip spin polarized. We have also made changes on figure 7 and 8 that could help the reader, as suggested by the referee.

Reviewer #2 (Remarks to the Author):

Manuscript Summary:

The authors present a uniaxial strain device which can be used in ultra-high vacuum for surface sensitive measurements such as STM and ARPES. The device turns out to be very efficient to obtain a single AFM domain in FeTe. It is very important to study the intrinsic physical properties in materials which suffer from the twin structures and i recommend the publication of this paper after considering the following concerns i have:

Major Concerns:

(1) As mentioned, the device can be used for applying both compressive and tensile strain, however, the authors only show one set of strained data in Fig.8. The authors should specify what kind of strain they applied on this data. And it will be better that the authors can show data with both strain added.

We thank the referee for this important question. In our experiments a compressive strain was applied by rotating the micrometer screw by 50 degrees. The applied pressure is transmitted through the springs and correspond to a uniaxial pressure of 0.08 GPa. From the in-plane Young's modulus of FeTe of 70GPa, the applied uniaxial pressure can be converted to 0.1% uniaxial strain. In the new manuscript we have clarified the applied compressive strain magnitude.

The device is designed so that in an analogous way a tensile strain can be applied, yet the latter has not been tested so far. In the manuscript we emphasized that while both compressive and tensile strain applications are analogous in nature, tensile strain has not been tested yet.

(2) To have an idea of how uniform the strain is by using this device, i would suggest the author to include a figure showing the AFM domain at different sample positions (As the sample should be around 1mm*2mm size, it will be better the authors can show the region around the corner, in the center, etc.)

This is also very important question. We mention in the manuscript that STM is done near the center of the sample where the strain is expected to be maximum (see ref.14 of the main manuscript for a theoretical model). We have studied the variation of the strain on various locations, and as long as the tip is within a few hundred microns of the center of the sample no domains are found, indicating a rather uniform strain. However, when we move the STM tip to edge of the sample, domains do appear. This is expected since the edges of the sample, which are epoxied on top of the device will not experience strain. This has been clarified in the new manuscript.

Minor Concerns:

There are already some studies reported before using the similar design to do the transport measurement (Phys. Rev. B 88, 115130 (2013)) and ARPES measurement (Phy. Rev. B 85, 085121 (2012), New J. Phys. 19 103021 (2017)) which cleaved the single crystal in situ with the strain applied. The authors should cite them.

Thank you for providing this information, the citations have been added to the new manuscript.

Reviewer #3 (Remarks to the Author):**Manuscript Summary:**

This manuscript reports a new experimental protocol for providing tunable strains to the samples investigated by scanning tunneling microscopy.

Such protocols are important in condensed matter physics and very few publications outline details in the experimental protocol of applying strain.

In this context the manuscript is quite relevant for a broad audience of experimentalists. The authors also demonstrate their technique using parent compounds of

iron-based superconductors ($\text{Fe}(1+g)\text{Te}$). The manuscript is written in a clear way outlining all relevant details.

Minor Concerns:

The only possible concern related to this work is a question of how easy/or difficult it is to apply this experimental protocol on other classes of materials.

This is a fair question and a bit tricky to answer. One of the major difficulties is the cleaving process itself. For layered systems which are easily cleaved the success rate is high. We have successfully applied this technique to Bi2212 , high temperature superconductor, in both STM and resonant x-ray studies. However, when dealing with samples that lack a natural cleavage plane, one may face new challenges.