**Readme**

The jupyter notebook named “TaTiO annealed polycrystal 202312 final.ipynb” processes the data to produce the microscopy / crystallography figure, provided path variables are adjusted to whatever is appropriate for your own system. It does require that *py4dstem* (>0.14.17) and *orix* are installed in your python environment.

It takes the raw scanned diffraction data in the file “IM104 untilted.hdf5” and performs automated crystal orientation mapping against the structure defined in the “Anatase\_ICSD\_CollCode92363.cif” file. The result of this mapping has been precomputed (as the computation is slow and computationally expensive, especially on a standard processor) as “IM104 untilted\_ACOMresult.ang” which allows you to skip the orientation mapping step and just compute the dark field image for SiO2 from the hdf5 file, and calculate the orientation maps in orix (at the end of the notebook) from the ang file.