Supplementary Material for:

Interrogating the Effects of Hydrogen on the Behavior of Planar Deformation Bands in Austenitic Stainless Steel

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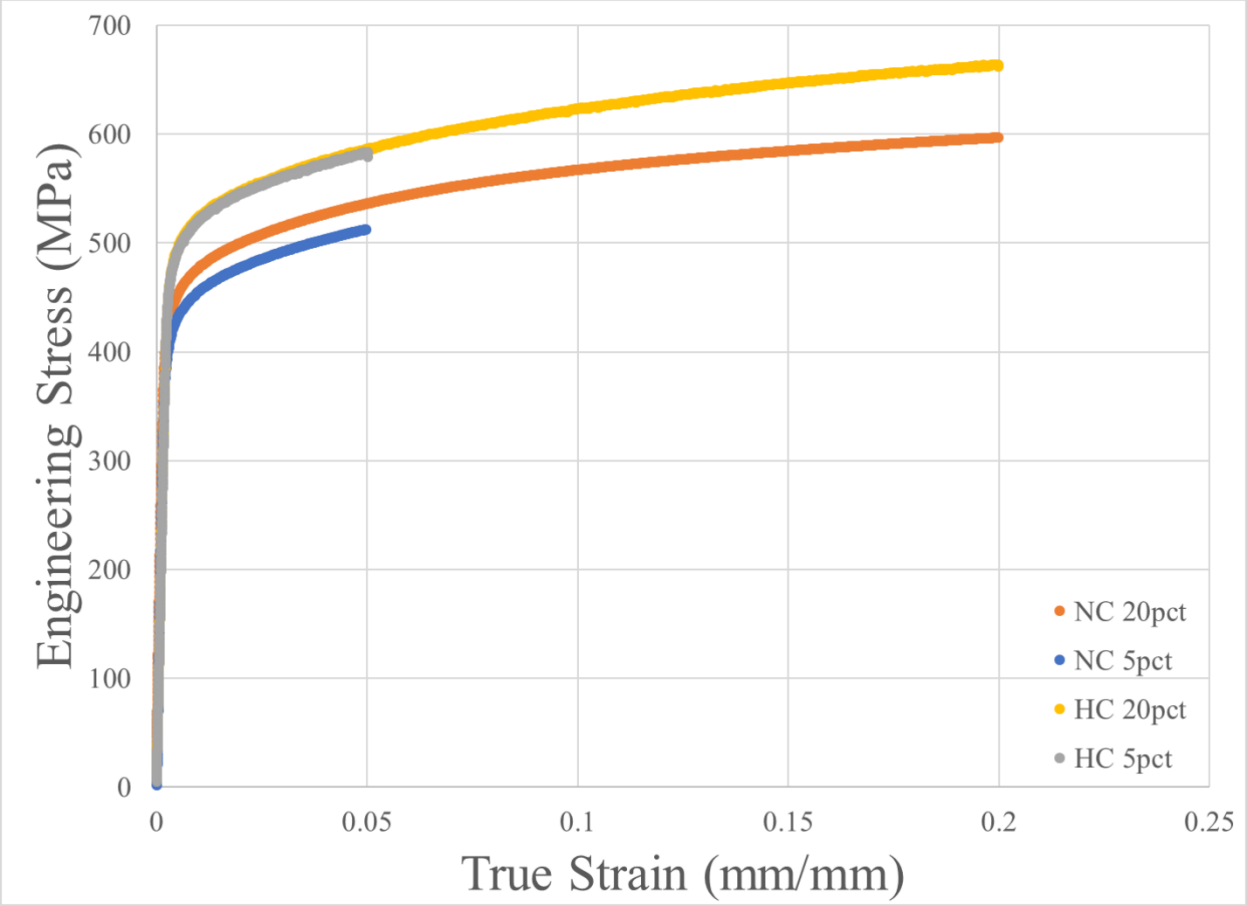

Fig. S-1: Stress-strain curves for the samples used in this study. The yield strength is increased appreciably in samples containing internal hydrogen.

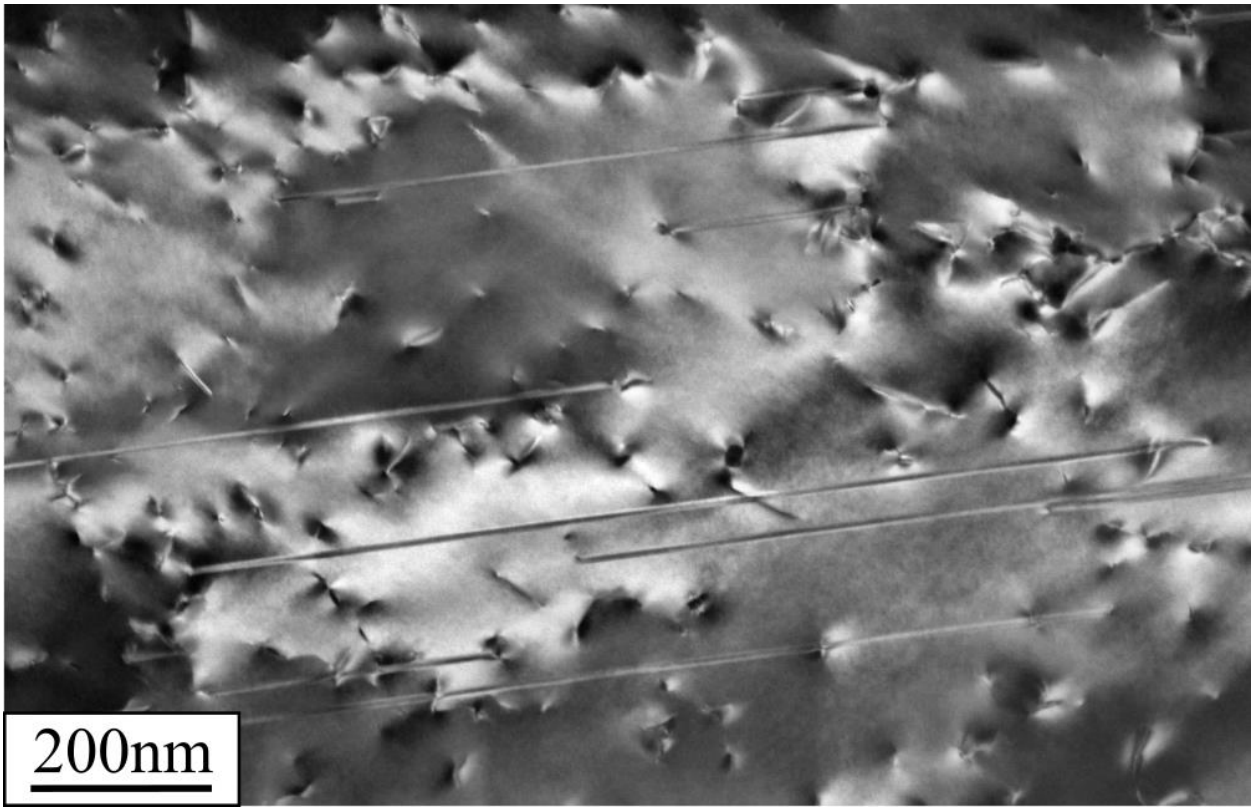

Fig. S-2: High magnification of stacking faults observed within the as-forged HC microstructure. Stacking faults terminate at the crystallographically required $\frac{1}{6}\langle 112\rangle$ dislocations (as determined in $\vec{g}\cdot\vec{b}$ analysis in Figure 3), indicating that these SF arise from the separation of partials located within the heavily deformed forged microstructure.

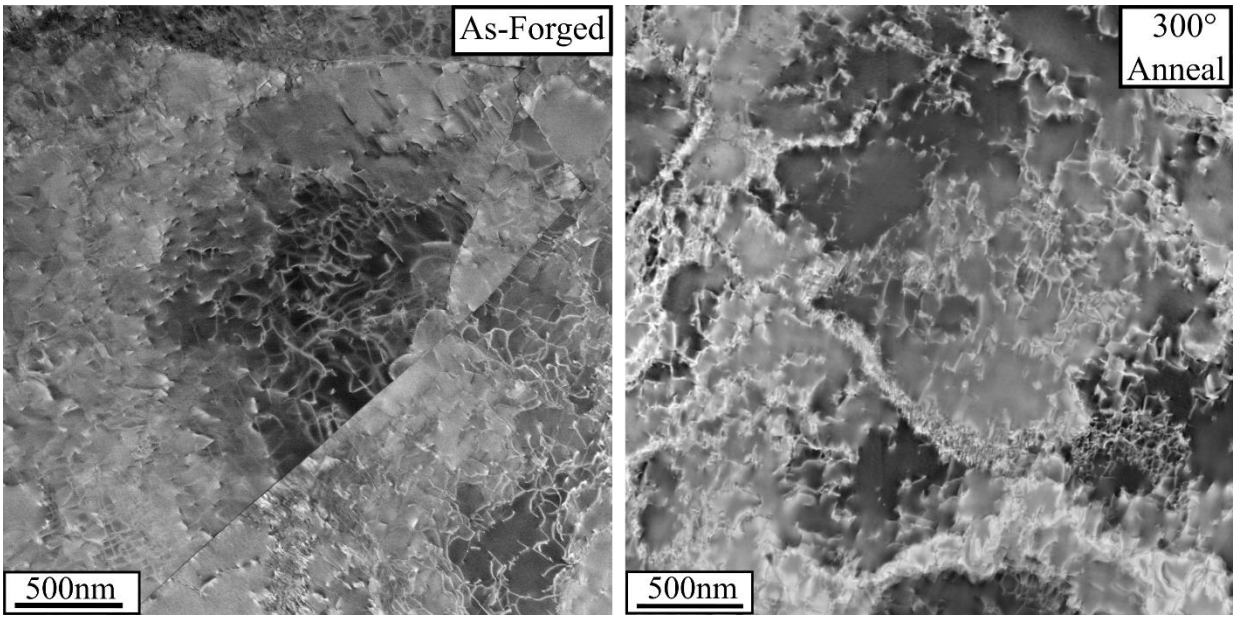

Fig. S-3: Comparison of NC material which has been subjected to the 300°C 1 week anneal, and the as-forged material without any additional heat treatment used in the NC tensile tests of supplementary Fig. S-1. Note the lack of any appreciable change of the dislocation microstructure or the formation of stacking faults.

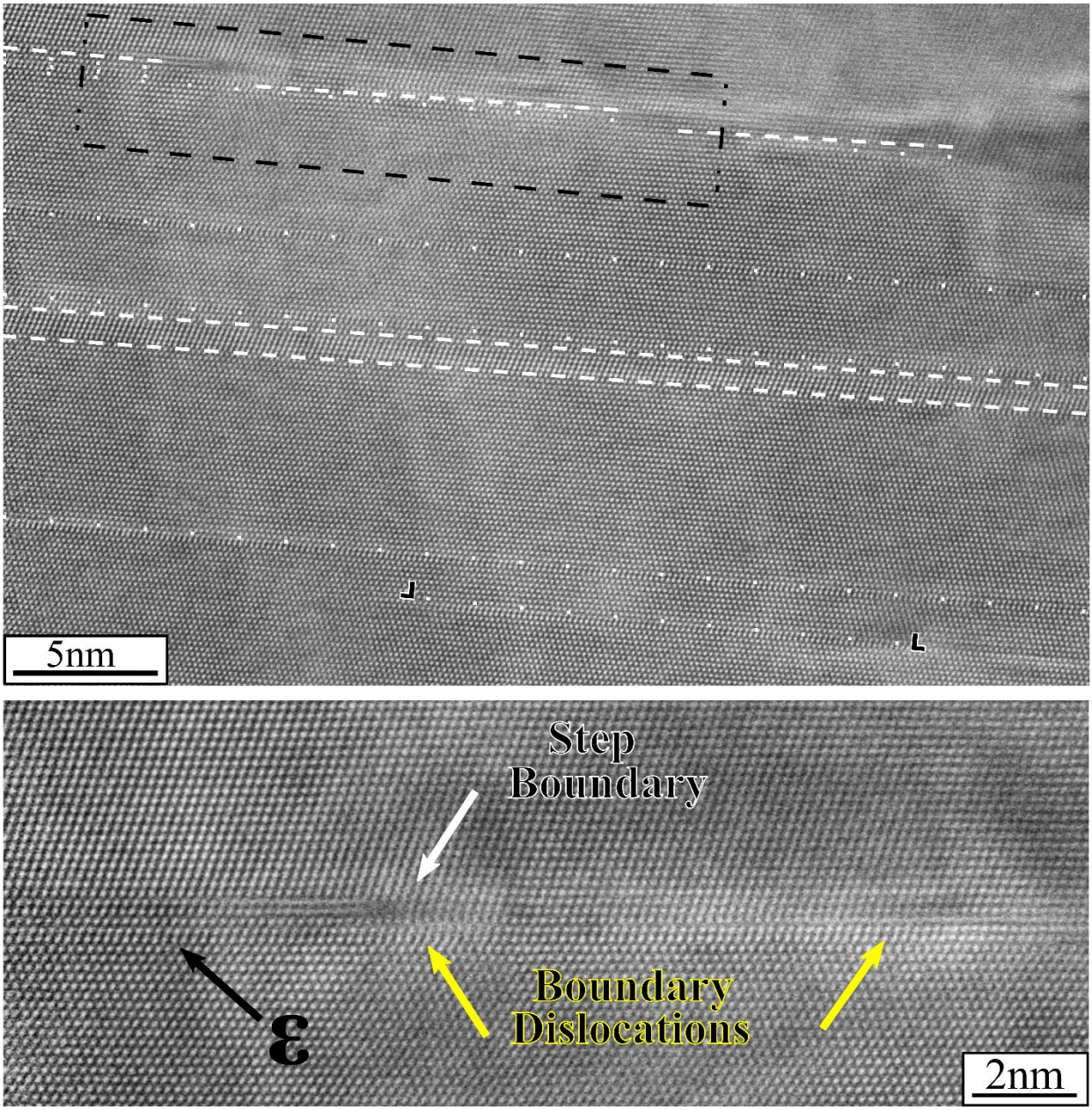

Fig. S-4: HRSTEM images taken from the 20% Strained NC sample of Figure 8 (top) with magnified image from the black box on bottom. A stepped twin boundary (white arrow) containing ε-martensite (black arrow), and a $\frac{1}{3}[\bar{1}1\bar{1}]$ sessile dislocation (left yellow arrow), and a $\frac{1}{2}[\bar{1}0\bar{1}]$ lattice dislocation (right yellow arrow) along the boundary can also be observed. The ε-martensite present along the twin boundary is only a few atomic planes thick. Boundary ε-martensite has only been observed at 20% true strains in NC specimens, and not in the 5% NC specimen.