

Abstract Submitted
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Magnetic and Structural characterization of Co nanowires using advanced electron microscopy techniques¹ JESUS CANTU-VALLE, FRANCISCO RUIZ-ZEPEDA, JOHN EDER SANCHEZ, FERNANDO MENDOZA-SANTOYO, ARTURO PONNCE, University of Texas at San Antonio, UTSA TEAM — We report the magnetic imaging and crystalline structure of high aspect ratio cobalt nanowires. Experimental results of magnetization reversal in cobalt nanowires are presented to illustrate the functionality of the *in situ* magnetization process through the manipulation of the objective lens. By making use of this applicability, we measure the magnetization and show experimental evidence of the magnetic flux distribution in polycrystalline cobalt nanowires using off-axis electron holography. The retrieved phase map can distinguish the magnetic contribution from the crystalline contribution with high accuracy. To determine the size and orientation of the grains within the Co nanowires, PED-assisted orientation mapping was performed. Finally, the magnetic analysis performed at individual nanowires was correlated with the crystalline orientation map, obtained by PED-assisted crystal phase orientation mapping. The large shape anisotropy determines the major magnetization direction rather than the magneto-crystalline anisotropy in the studied nanowires. The combination of the two techniques allowed us to directly visualize the effects of the crystallographic texture on the magnetization of the nanowire.

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