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Spins and Twins: Correlation between Crystallographic and Magnetic Domains at Co/NiO(001) Interfaces HENDRIK OHLDAG, SSRL, Menlo Park CA, USA., ELKE ARENHOLZ, ALS, Berkeley CA, USA, GERRIT VAN DER LAAN, Diamond Light Source, Chilton UK — Using soft x-ray spectromicroscopy we show that NiO(001) exhibits a crystallographic and magnetic domain structure near the surface identical to that of the bulk. Upon Co deposition a perpendicular coupling between the Ni and Co moments is observed that persists even after formation of uncompensated Ni spins at the interface through annealing. The chemical composition at the interface alters its crystallographic structure and leads to a reorientation of the Ni moments from the h112i to the h110i direction. We show that this reorientation is driven by changes in the magnetocrystalline anisotropy rather than exchange coupling mediated by residual uncompensated spins.

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