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Electronic bandstructure of the NiMnSb(001) surface above and below the Fermi energy JULIET CORREA, Physikalisches Institut, Westfälische Wilhelms-Universität Münster, CHRISTIAN EIBL, GEORGI RANGELOV, JÜRGEN BRAUN, MARKUS DONATH — The predicted 100% spin polarization at the Fermi energy (E_F), together with the high Curie temperature (750K) of the half-Heusler alloy NiMnSb makes it interesting for technological applications. However, experimentally only 50% surface polarization has been observed. Knowledge of the electronic structure of NiMnSb is key to improving our understanding of this material. We report on surface bandstructure measurements for the (001) surface of single crystal NiMnSb. The experimental techniques used are angle resolved ultraviolet photoemission spectroscopy (ARUPS)and inverse photoemission spectroscopy (ARIPES) to probe the bandstructure both below and above E_F. ARUPS and ARIPES are used quasi-simultaneously in a multi- chamber UHV-system to ensure well defined and equal sample preparation conditions. We see both non-dispersive (ARIPES) and dispersive (ARUPS) structures in the spectra, which stem from d-like bulk states. With our normal emission UPS data, we resolve the conflict in the various contradictory reports in the literature about the position of spectral features for both polycrystal and single-crystal samples. Finally, through comparison with theoretical calculations we have identified a surface state candidate.

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