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Spin polarized surface states on stepped magnetic surfaces: ab-initio approach OLEG STEPANYUK, OLEG POLYAKOV, ALEXANDER SALETSKY, Moscow State University, WOLFRAM HERGERT, Martin-Luther-Universität Halle-Wittenberg — It was shown that surface states electrons become spin polarized above magnetic layers and nanoislands [1]. In the present work we perform the state of the art ab-initio studies of surface state electrons at steps of magnetic metals. We focus on steps of 3d metals on Cu(111) surface. We have revealed a spin-dependent charge transfer at step ages which is explained by Smoluchowski effect. Strongly inhomogeneous spin polarization of surface statates [1] at steps is revealed. Our results indicate that tunneling magnetoresistance at steps can exhibit very strong changes at the atomic scale.

[1] L. Diekhoner et. al. Phys. Rev. Lett. 90, 236801

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