

Non-collinear magnetism at surfaces driven by spin-orbit coupling

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Abstract

After the demonstration of the crucial influence of spin-orbit coupling (SOC) on magnetic structures in reduced dimensions and its successful explanation based on first-principles calculations (M. Bode et al., *Nature* 447, 190 (2007)), it became clear that SOC cannot be neglected in the description of magnetism in nanoscale systems.

In this project, we will study non-collinear magnetic states in the presence of SOC based on density functional theory calculations. We will explore 3d transition-metal monolayers on 5d transition-metal substrates which serve as ideal systems to investigate the interplay of SOC and exchange interactions. We will consider the influence of SOC on the magnetic order for both long- (spin spirals) and short-period (Néel state or so-called multiple-Q states) non-collinear magnetic structures.