

Charge - orbital order and topological effects in presence of zig-zag magnetic textures in 4d – 3d hybrid oxides

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The entanglement of spin, orbital and lattice degrees of freedom in correlated systems is known to lead to intricate quantum phenomena [1]. The interplay between more localized 3d and more delocalized 4d states in hybrid oxides tunes the competition between correlated metallic and Mott-insulating states. For instance, the magnetic and orbital patterns in a uniform 4d host can be strongly modified by the inclusion of 3d impurities substituting the 4d ions [2]. After discussing the most suitable microscopic models for different types of 4d-3d hybrids, we determine the phase diagrams assuming different conditions for the spin ordering in the metallic phase [3]. We obtain, inter alia, zig-zag magnetic patterns that host topologically protected Dirac points and lines due to complex non-symmorphic symmetries [4].

References:

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