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The edge engineering of topological Bi (111) bilayer XIAO LI, HAIWEN LIU, ICQM, Peking University, HUA JIANG, Department of physics, Soochow University, JI FENG, ICQM, Peking University — A topological insulator is a novel quantum state, characterized by symmetry-protected non-trivial edge/surface states. Our first-principle simulations show the significant effects of the chemical decoration on edge states of topological Bi (111) nanoribbon, such as the recovery of the linear dispersion and the extension of the penetration depth. A low-energy effective model is proposed to explain the distinctive spin texture of Bi (111) bilayer nanoribbon, which is different from the spin-momentum orthogonality paradigm of topological insulators. In particular, the Bi (111) bilayer nanoribbon offers a simple system for assessing conductance fluctuation of topological edge states, by comparing the edge states with and without chemical decoration.

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