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Edge states in Graphene: from gapped flat band to gapless chiral modes[1] SHENGYUAN YANG, The University of Texas at Austin, WANG YAO, The University of Texas at Austin, The University of Hong Kong, QIAN NIU, The University of Texas at Austin — We study edge-states in graphene systems where a bulk energy gap is opened by inversion symmetry breaking. We find that the edge-bands dispersion can be controlled by potentials applied on the boundary row. Under certain boundary potentials, gapless edge-states with valley-dependent velocity are found, exactly analogous to the spin-dependent gapless chiral edge-states in quantum spin Hall systems. The connection of the edge-states to bulk topological properties is revealed.

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