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Majorana edge states in single layer graphene LIN WANG, MING-WEI WU, University of Science and Technology of China, 96 JinZhai Road, Hefei, Anhui 230026 — We investigate the Majorana edge states in single layer graphene near the Dirac point with the Rashba spin-orbit coupling and an externally induced out-of-plane Zeeman splitting in the proximity of an s-wave superconductor. By calculating the topological invariant, we show the topological phase diagram. In the topological nontrivial regime, we study the Majorana edge states in the case of zigzag or armchair ribbon. For these two cases, both have two Majorana edge states along one edge. However, there exist strong anisotropies in the localization length, the group velocity and the momentum of the Majorana fermions in two ribbons. In addition, the effects of the in-plane Zeeman splitting and the disorder on the Majorana edge states are also discussed.

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