Zero modes in superconducting nanowires with Desselhaus spin-orbit coupling HSIEN-CHUNG KAO, National Taiwan Normal University — Using chiral decomposition, we are able to find analytically the zero modes in the Kitaev ladder model and superconducting nanowires with Desselhaus spin-orbit coupling. Analytic conditions for the existence of zero modes are obtained. As a result, we are able to predict the number of zero modes in these systems. Moreover, we find that when suitable resonance condition is satisfied exact zero modes exist even in finite systems contrary to the common belief.

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