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Bound states of edge dislocations¹ DEBAJIT GOSWAMI, KINJAL DASBISWAS, CHI-DEUK YOO, ALAN DORSEY, University of Florida — We investigate bound state solutions of the 2D Schrödinger equation with a dipole potential originating from the elastic effects of a single edge dislocation. These solutions are important for several physical systems, including the binding of ^3He impurities to dislocations in solid ^4He , and the nucleation of superfluidity on dislocations in ^4He . We present a variational estimate for the binding energy and numerically solve the eigenvalue problem to obtain several bound states. In our nondimensionalized units, we find a ground state energy of -0.139. The energy spectrum obtained matches with that from semiclassical considerations.

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