Hofstadter's butterfly with Rashba spin-orbit coupling[1] SUKEY
SOSA Y SILVA SALGADO, FERNANDO ROJAS, Centro de Ciencias de la Materia Condensada, UNAM — We study the energy spectrum of an electron in a two-dimensional periodic lattice in a perpendicular magnetic field in the tight-binding approximation including the Rashba spin-orbit coupling. We have investigated how the fractal spectrum known as Hofstadters butterfly is modified if one includes the spin-orbit coupling. We find a set of decoupled Harper-like equations for each spinor by restricting the Rashba coupling along one direction. We solve the set of equations and evaluate the energy spectrum for each spinor. In order to characterize the energy spectrum we calculate its fractal dimension, in particular, we analyze the capacity and the correlation dimension of each spin-subbands buttlerfly as a function of the spin-orbit coupling parameter and magnetic field.

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