

Edge state in a tight-binding model on a ribbon

George Tsitsishvili^a, Merab Eliashvili^a

e-mail: giorgi.tsitsishvili@tsu.ge

^aDepartment of Physics, Faculty of Exact and Natural Sciences,
Ivane Javakhishvili Tbilisi State University
3, I. Chavchavadze ave., Tbilisi 0179, Georgia

We study the tight-binding model on a ribbon with hopping anisotropies. In general the system exhibits three different phases – edge, bulk and compound (coexistence of edge and bulk constituents). Edge states can emerge in a several different types. Using numerical methods we have calculated the energy bands and have built the phase diagramme, where the edge states occur in two different modifications. These are a) edge state with a single length scale (decay rate of an edge state) and the other – edge state with two distinct length scales.