Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Quantum dots in graphene-like materials THAKSHILA HERATH, VADYM APALKOV, Georgia State University — We study numerically the electron states in silicene and germanene quantum dots within the effective low energy model of silicene and germanene. The quantum dots are realize through spatial variation of perpendicular electric field, i.e., bias voltage. The energy spectra of such quantum dots are obtained for different parameters of the dots, which are the size of the dot and the strength of external electric field. For cylindrically symmetric spatial profile of electric field, the electron states of the dot are characterized by z-component of the angular momentum. Due to strong spin-orbit interactions in such buckled graphene-like materials, the states in the quantum dots have unique spin texture, which is more pronounced for germanene quantum dots. The dependence of spin polarization of electron states in the quantum dots on the strength of electric field is also obtained.

Thakshila Herath
Georgia State University

Date submitted: 14 Nov 2014 Electronic form version 1.4