Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Valley Structure and Giant Spin Splitting in Lead Salts Nanowires IVAN AVDEEV, ALEXANDER PODDUBNY, Ioffe Institute, SERGUEI GOUPALOV[1], Jackson State Univ, MIKHAIL NESTOKLON, Ioffe Institute — We employ tight-binding method and $\mathbf{k} \cdot \mathbf{p}$ theory to analyze valley structure of PbSe nanowires grown along the [111] direction and having unit cells of different point symmetry: D_{3d}, D_3, and C_{2h}. We show that, while all three nanowire symmetries ehxibit large valley splittings of electronic subbands, the D_3 wires are of special interest, as they possess a screw axis which results in appreciable spin-dependent splittings of electronic subbands, linear in one-dimensional wave vector.

[1]Also with Ioffe Institute

Serguei Goupalov
Jackson State Univ

Date submitted: 11 Nov 2016 Electronic form version 1.4