Meeting: 1000, Albuquerque, New Mexico, SS 7A, Special Session on Spectral Geometry

1000-35-20 **Mitya Boyarchenko** and **Sergei Levendorskii*** (leven@eco.utexas.edu), University of Texas at Austin, Department of Economics, 1 University Station C3100, Austin, TX 78712-0301. *Beyond the classical Weyl and Colin de Verdière's formulas for Schrödinger operators with polynomial magnetic and electric fields.*

We present a pair of conjectural formulas that compute the leading term of the spectral asymptotics of a Schrödinger operator on $L^2(\mathbb{R}^n)$ with quasi-homogeneous polynomial magnetic and electric fields. The construction is based on the orbit method due to Kirillov. It makes sense for any nilpotent Lie algebra and is related to the geometry of coadjoint orbits, as well as to the growth properties of certain "algebraic integrals," studied by Nilsson. By using the direct variational method, we prove that the formulas give the correct answer not only in the "regular" cases where the classical formulas of Weyl or Colin de Verdière are applicable but in many "irregular" cases, with different types of degeneration of potentials. (Received June 28, 2004)