1125-81-591 **Alexander Turbiner*** (turbiner@nucleares.unam.mx), Instituto de Ciencias Nucleares, UNAM, AP 70-543, 04510 Mexico-City, DF, Mexico. *The Heun operator as a Hamiltonian.* Preliminary report.

It is shown that the celebrated Heun operator $H_e = -(a_0x^3 + a_1x^2 + a_2x)\frac{d^2}{dx^2} + (b_0x^2 + b_1x + b_2)\frac{d}{dx} + c_0x$ is the Hamiltonian of the $sl(2,R)$-quantum Euler-Arnold top of spin ν in a constant magnetic field. For $a_0 \neq 0$ it is canonically-equivalent to $BC_1(A_1)-$ Calogero-Moser-Sutherland quantum models, if $a_0 = 0$, ten known one-dimensional quasi-exactly-solvable (QES) problems are reproduced, and if, in addition, $b_0 = c_0 = 0$, then four well-known one-dimensional quantal exactly-solvable problems are reproduced. If spin ν of the top takes (half)-integer value the Hamiltonian possesses a finite-dimensional invariant subspace and $(2\nu+1)$ polynomial eigenfunctions occur. Discrete systems on uniform and exponential lattices are introduced which are canonically-equivalent to one described by the Heun operator. (Received September 07, 2016)