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Stability of the rotating Lewis-Langmuir cubic atom in the Circularly Polarized Electromagnetic and the Magnetic Fields MATT KALINSKI, Utah State University — We consider a fully saturated true Lewis-Langmuir [1-2] atom when all of the eight electrons are occupying the corners of the cube. Such symmetric configuration exists for the arbitrary edge length without rotation for the resonant mathematical value of the nuclear ion charge $Z^* = (6\sqrt{3} + 3\sqrt{6} + 2)/8 = 2.4676$. When $Z > Z^*$ the existence of the atom must be forced by the rotation and when $Z < Z^*$ by the compressing rotation in the magnetic field both with the square cuboidal deformation. When the rotating electric field is added the atom further deforms to the trapezoidal hexahedron. We study the classical dynamic stability of the configuration when the stable classical configuration is resulting in the 8-electron nondispersing wave packets localized around the edges of the configuration building the quantum atom. We find the stability islands much more exotic then for our recently discovered two electron Langmuir configurations in the helium atom. Exact quantum time dependent numerical simulations of the nondispersing 24-dimensional wave packets using our new recently discovered Time Dependent Quantum Diffusion Monte Carlo Method are also provided. [1] G. N. Lewis, J. Am. Chem. Soc. **38**, 762, (1916) [2] I. Langmuir, J. Am. Chem. Soc. **41**, 868, (1919)

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