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COMPOSITE ELECTROMAGNETIC, WEAK AND STRONG NUCLEAR SELF-FIELD THEORY

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Recently EM self-field theory (EMSFT) was used (1) to model the electronic-nuclear interaction. As a first approximation to the hydrogen atom, the proton and the electron had point-mass structures. Using 'physical' spinors to represent the particles and fields, the Maxwell-Lorentz equations yield analytic eigenvalue solutions for the discrete energy levels within the atom that agree with the Bohr theory. The electron's magnetic moment given by the fine structure is seen as a cyclotron motion due to the magnetic field of the proton's cyclotron motion which in turn is induced by the cyclotron motion of the electron, a part of the hydrogen atom's self-field system. The hyperfine structure was not considered in this simple model requiring a more detailed three-quark model. Maxwell's divergence equations provide the analytic form for the spinors, while Maxwell's curl equations provide a balance of electric and magnetic kinetic and potential energies. The motions due to the EM fields are termed 'bispinors' as each motion consists of two orthogonal spinorial motions.

Self-field theory (SFT) was also used (2) to investigate a photon with non-zero mass having a substructure. The solution for the photon shows an analytic similarity to the hydrogen atom. The photon has its own spectroscopy with Balmer-like frequencies. A 'photon chemistry' has been predicted (3) in which compounds of the ordinary photon occur depending on the energy density in a region, for instance inside the nucleus, or near the centre of the nucleus. Such photon chemistry also explains many biological phenomena such as the emission of photons by strands of DNA (4) These photonic compounds create fields that mediate the EM, strong, and weak forces. Each field-type supports a particle-type and its motions. For instance near the centre of the nucleus the energy density is raised above that in the EM region outside the nucleus but not as high as in the strong nuclear region wherein gluons can exist. This permits the existence of the W+, W- and Z0 bosons, and the weak forces can bind the weak electron inside the nucleus with a binding energy equal to that of the neutrino.

Particle motions in strong nuclear regions are 'tri-spinors', three orthogonal motions. A modified form of Maxwell's equations is used for these regions consistent with such motions, analogous to group theory to yield quantum electrodynamic and chromodynamic solutions. Like EMSFT, the composite theory results in a system of inhomogeneous equations. For atomic EM fields, the bispinors result in four equations for the electron and four for the proton in the hydrogen atom. For the strong nuclear fields, there are six variables per quark, corresponding to the three spinors, hence eighteen variables per proton.

References

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