# Computation of the hyperfine structure constant in $^3P_{1,2}$ and $^1D_2$ of $^{207}_{82}$Pb $6p^2$ using a Multi-Configurational Dirac-Hartree-Fock approach with the General Relativistic Atomic Structure Package 2018 [3]

Martin Kinden Karlsen

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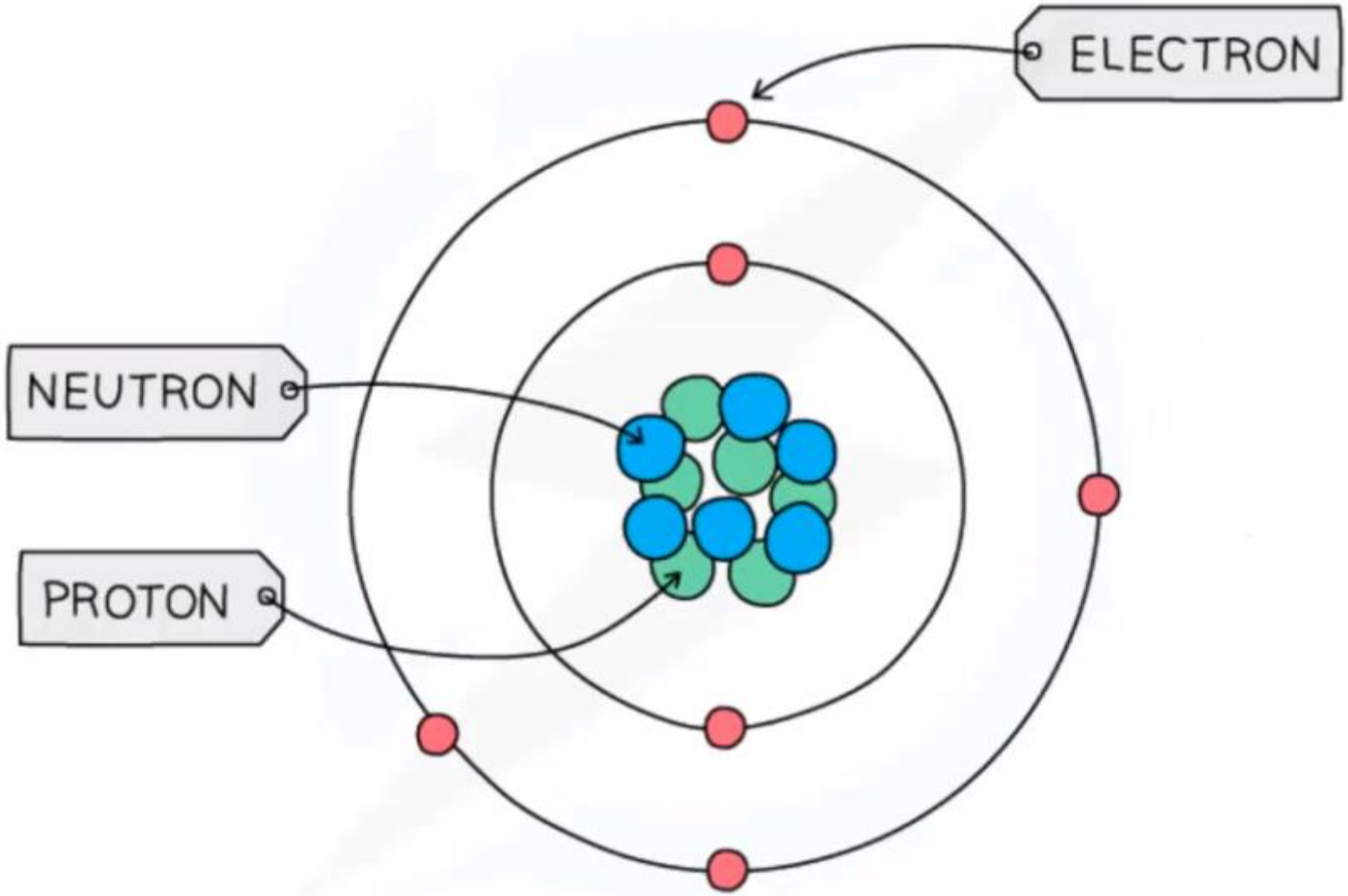
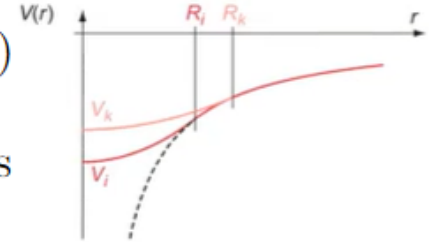

ELECTRON
NEUTRON
PROTON

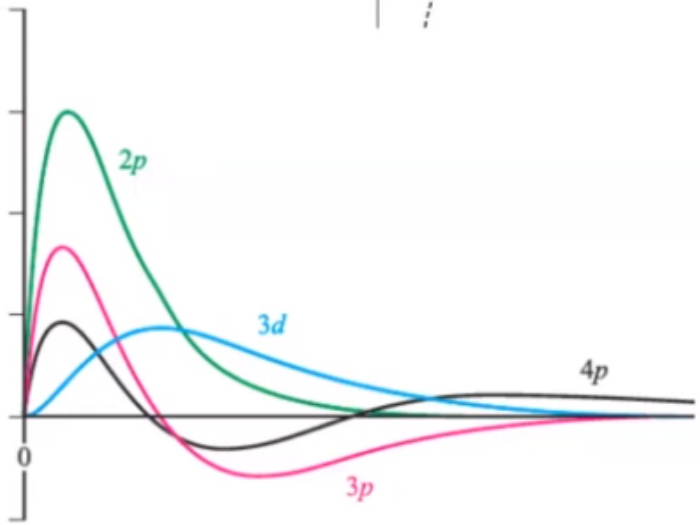
***rnucleus*** - define nuclear data (Z, mass, spin, dipole+quadrupole moment)




***rcsfgenerate*** - generate CSF basis, within an active space of one-$e^-$ orbitals

***rcsfinteract*** - remove weakly interacting CSFs

***rangular*** - pre-compute spin-angular integrals




***rwfnestimate*** - initial estimates of the radial orbitals

$$\phi_{n\kappa m}(\vec{q}) = \frac{1}{r}\begin{bmatrix} P_{n\kappa}(r)\Omega_{\kappa m}(\theta,\phi) \\ iQ_{n\kappa}(r)\Omega_{-\kappa m}(\theta,\phi) \end{bmatrix}$$

Optimizes the radial orbitals

***rmcdhf*** - Dirac-Coulomb self-consistent field procedure

$$\Psi(\gamma J^\pi M) = \sum_{i=1}^{N} c_{\gamma_i} \Phi(\gamma_i J^\pi M)$$

and mixing coefficients

***rci*** - configuration-interaction with Breit+QED

***rhfs*** - compute magnetic dipole and electric quadrupole hyperfine structure constants, and Landé $g_J$-factors.