Problem Set 5

$$E^{R_A}_{coul} = \sum_{\mu\nu} X_{\mu\nu} S^{R_A}_{\mu\nu} + \sum_{B \neq A} \gamma_{AB} \gamma^{R_A}_{AB} + V^{R_A}_{nuc}$$

$X_{\mu\nu}$:

γ_{AB}:

$$h_{\mu\mu} = \frac{-1}{2}\left(I_\mu A_\mu\right) - \left(Z_A - \frac{1}{2}\right)\gamma_{AA} - \sum_{B=A} Z_B \gamma_{AB}$$

$$h_{\mu\nu} = \frac{1}{2}\left(\beta_A + \beta_B\right) S_{\mu\nu}$$

$$f^{\alpha}_{\mu\mu} = h_{\mu\mu} + \left(P_{AA} - P^{\alpha}_{\mu\mu}\right)\gamma_{AA} + \sum_{B \neq A} P^{tot}_{BB} \gamma_{AB}$$

$$f^{\alpha}_{\mu\nu} = h_{\mu\nu} - P^{\alpha}_{\mu\nu} \gamma_{AB}$$

$$X_{\mu\nu} = \left(\beta_A + \beta_B\right) P^{tot}_{\mu\nu}$$

$$\gamma_{AB} = P^{tot}_{AA} P^{tot}_{BB} - Z_B P^{tot}_{AA} - Z_A P^{tot}_{BB} - \sum_{\mu \in A} \sum_{\nu \in B} \left(P^{\alpha}_{\mu\nu} + P^{\beta}_{\mu\nu} \right)$$