Apply EI method to adiabatic Hamiltonian

$$\mathcal{H}^{[A]}(s) = \underbrace{T_K(s)}_{H_0} + V^{[A]}(s, \mathcal{R}_A)$$

H_0 has as eigenfunctions hyperspherical harmonics $y_{\underbrace{[K_A]}_{\text{set of qu nrs}}}$

Model space P: complete set of HH basis functions with generalized angular momentum quantum number $K \leq K_P$

Q-space: complete set of HH basis functions with $K > K_P$

For each s-value: construct eff. adiabatic Hamiltonian

$$\mathcal{H}^{[A]\,eff}(s, \mathcal{R}) = P T_K(s) P + P V^{[A]\,eff}(s, \mathcal{R}_A) P$$

↳ A-body interaction

↓ approximate

$$V^{[A]\,eff} \approx \sum_{i<j}^{A} v_{ij}^{[2]\,eff} \Leftarrow \text{sum of two-body terms}$$

$$\text{use } \langle V^{[A]\,eff} \rangle \approx \langle \sum_{i<j}^{A} v_{ij}^{[2]\,eff} \rangle = \frac{A(A-1)}{2} \langle v_{A,A-1}^{[2]\,eff} \rangle$$

How does one obtain $v_{A,A-1}^{[2]\,eff}$?