

# Correcting Choice of Lambda

	$\hat{S}^2$	$\lambda$
classical	$s^2$	0
quantum	$s(s + 1)$	$\frac{1}{2}$
Langer modification	$\left(s + \frac{1}{2}\right)^2$	$\frac{3}{4}$

Value selected based on short-time analysis of 2-state populations and many-electron currents

# Mapping Multiple States

$$\langle \mathbf{n}' | \hat{a}_i^\dagger \hat{a}_j | \mathbf{n} \rangle = \delta_{n_i, n'_i+1} \delta_{n_j, n'_j-1} \prod_{p=i+1}^{j-1} (-1)^{n_p} \prod_{q \neq i, j} \delta_{n_q, n'_q}$$

This is the direct product of 2x2 matrices for each dof!