Brief Article

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1 Mathematical Formulation

There are three components to the JCM Hamiltonian can be broken down into three separate pieces, the individual Hamiltonians arising from the field, atom and interaction between the two:

$$H = H_{field} + H_{atom} + H_{int}$$

The field Hamiltonian can be derived as follows. (JCM paper uses Slater[10]) The cavity is represented by volume V bounded by closed surface S. Then for the field E, the solution to the boundary value problem,

$$\nabla \times \nabla \times E - k^2 E = 0, \text{ in V} \tag{1a}$$

$$n \times E = 0 in S, \text{ in S} \tag{1b}$$