

Chem. 550
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BASICS PROBLEM 2

A particle experiencing a harmonic potential is prepared in the following initial state:

$$\Psi(x;0) = \frac{1}{\sqrt{5}}(2\Phi_0(x) + \Phi_1(x)),$$

where Φ_0, Φ_1 are the ground and first excited eigenstates of the harmonic oscillator Hamiltonian. Find $\Psi(x;t)$ and show explicitly (in the coordinate representation) that it satisfies the time-dependent Schrödinger equation.