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The illustration of initial-state dependence for two non-interacting electrons in one dimension in Fig. 1 was incorrect because the orbitals $\phi_1$ and $\phi_2$ were not chosen to be orthogonal.

A simpler example is provided here. An orthonormal choice, satisfying the conditions that $\Phi$ and $\tilde{\Phi}$ have equal density and equal first time-derivative of the density, is

$$
\tilde{\phi}_1(x) = \sqrt{1 + f(x)\phi_2^2(x)}\phi_1(x)
$$

$$
\tilde{\phi}_2(x) = \sqrt{1 - f(x)\phi_1^2(x)}\phi_2(x)
$$

(1)

where $\phi_1$ and $\phi_2$ are the lowest and first excited states of the harmonic oscillator of $k = 1$ and $f(x) = c(256x^4 - 192x^2 + 12)e^{-2x^2}$. The parameter $c$ may be arbitrarily chosen between about -0.172 and 0.147. In the figure below we take $c = -0.1$. The top panel of the figure shows the orbitals and the density while the lower panel shows the initial potentials which keep the densities constant and equal.

![Diagram of orbitals and potentials](image_url)

FIG. 1. The top panel shows the lowest and first excited state orbitals $\phi_1$ and $\phi_2$ (solid) for the harmonic potential, the alternative orbitals $\tilde{\phi}_1$ and $\tilde{\phi}_2$ (dashed), and the density, $n$ (thick solid) which is the same for $\Phi$ and $\tilde{\Phi}$. In the lower panel are the initial potentials $v$ (solid) and $\tilde{v}$ (dashed) in which $\Phi$ and $\tilde{\Phi}$ respectively, evolve with the same density.