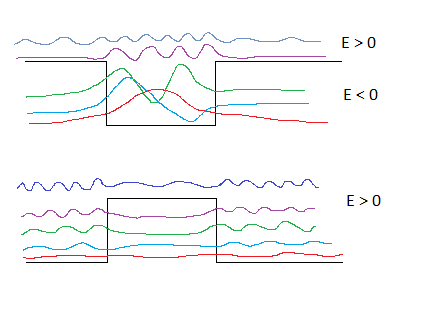
**General Picture of Wavefunctions**

So in general, the wavefunctions look like this below, displaced upwards in proportion to energy.



For attractive potentials, we can have a few discrete bound states, with exponentially decaying tails, and negative energies. But as the wavefunction gets curvier and curvier, its KE increases and eventually surpasses the potential well attraction, and we get positive energy states. These will oscillate everywhere, but be almost flat on the outside for E ≈ 0.

For repulsive potentials, we’ll also have a continuum of positive energy states. The E≈ 0 state is almost flat on the outside and exponentially decaying on the inside. As E increases, the curvature on the outside continuous to increase, but we’ll still get exponential decay on inside, until E > V.

If we generalize to 2D or 3D, everything is basically the same, except for the fact that we aren’t guaranteed negative energy states for any attractive potential strength, though we’ll always have that continuum of positive E > 0 energy states.