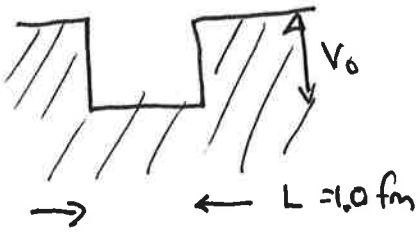
TL 6-25 (finite square well)



If the well contains a neutron, how deep must it be so that it has only two bound states?

The ground state energy is approximately (but slightly lower than) that of a neutron in an infinite well.

So $E_1 = \frac{n^2 h^2}{8mL^2} = 204.5\,\text{MeV}$ for $n=1$

The first excited state is $E_2 = 4E_1 = 818\,\text{MeV}$

The depth must be about 818 MeV