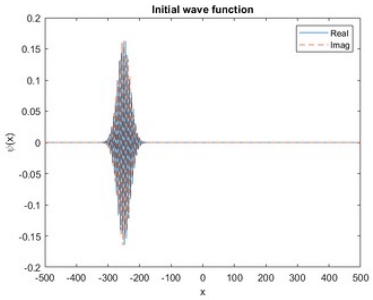
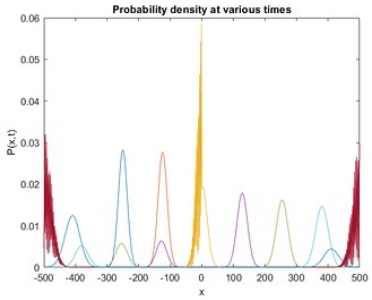
For $u = 0.5$, Here is -





(a) initial wave function (b) Probability density at various times

Figure : 1

In figure-1(b),

we can see the traveling Gaussian Packet bumping at the δ-function barrier and then decomposing into two different wave. one getting back the way it was initially approaching from (reflected wave), and the other one passing through the barrier and continuing to move in the same direction, that it was doing before the bump. (transmitted wave).

That means, the wavepacket is partially transmitted and partially reflected.

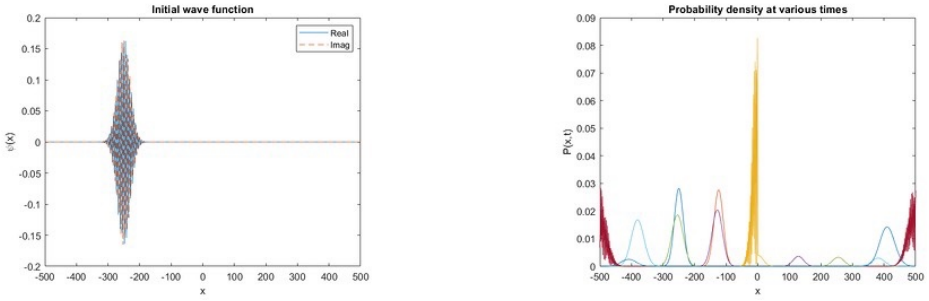
And, amplitude of the -

reflected wavepacket is : 0.8594

transmitted wavepacket is : 0.5113

these wavepackets are not normalized. that's why their amplitudes don't add to be 1. (more than 1).

For $u = 2.0$, here is -



(a) initial wave function (b) Probability density at various times

Figure : 2

In 2(b), we see the same occurance just like 1(b), and it implies the reflection and transmission of the wave-packet after the bump at the potential barrier.

And, amplitude of the —

reflected wavepacket is : 0.3878

transmitted wavepacket is : 0.9218

these wavepackets are not normalized. that's why their amplitudes don't add to be 1. (more than 1)