

HW1 Bonus: Shabani – QM1 Due Sept 23rd

1. Vaidman and Elitzur (VE) imagined a problem as follow: they thought of bombs that can be triggered using a photon detector. The way they work is that a narrow tube goes across each bomb and in the middle of the tube there is a photon detector. To detonate the bomb one sends a photon into the tube. The photon is then detected by the photon detector and the bomb explodes. If the photon detector is defective, however, the photon is not detected at all. It propagates freely through the tube and comes out of the bomb. The bomb does not explode.

Suppose we have a number EV bombs, but we know that some of them have become defective. How could we tell if a bomb is operational without detonating it? Assume, for the sake of the problem, that we are unable to examine the detector without destroying the bomb.