

A beam of particles consists of a fraction  $10^{-4}$  electrons and the rest are photons. The particles pass through a double layer detector which gives signals in zero, one or two layers.. The probabilities for these outcomes for electrons ( $e$ ) and photons ( $\gamma$ ) are:

$P(0 e)$	$=$	$0.001$	$P(0 \gamma)$	$=$	$0.99899$
$P(1 e)$	$=$	$0.01$	$P(1 \gamma)$	$=$	$0.001$
$P(2 e)$	$=$	$0.989$	$P(2 \gamma)$	$=$	$10^{-5}$

1. What is the probability that a particle which was detected in only one layer is a photon? You are finding  $P(\gamma|1)$ .
2. What is the probability that a particle which was detected in two layers is an electron? You are finding  $P(e|2)$ .