

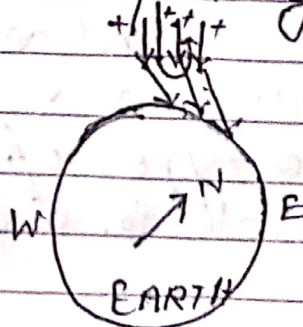
## E-W asymmetry $\rightarrow$ :

It has been found that the intensity of cosmic rays coming from west is higher from the east. This asymmetry is called east-west effect.

The constant bombardment of the earth's atmosphere by cosmic rays creates a constant shower of secondary particles, one of which is the  $\pi$  mesons (Pions). The pions are extremely unstable and rapidly decay into secondary particles. The primary decay modes of both charged and neutral pions

Due to the fact that there are two different charges ( $\mu^+$  and  $\mu^-$ ) that the earth's magnetic field is directed from south to north and the cosmic ray particles are coming vertically. By Fleming's left hand rule, positively charged particles will be deflected in a direction opposite to the negatively charged ones.

Positive muons will be deflected east and negative muons will be deflected west. As a most of the



cosmic rays are positively charged, there should be slightly more positive muons than negative muons. One would thus expect to see an east-west asymmetry. This asymmetry is known as the  $\mu$  effect.