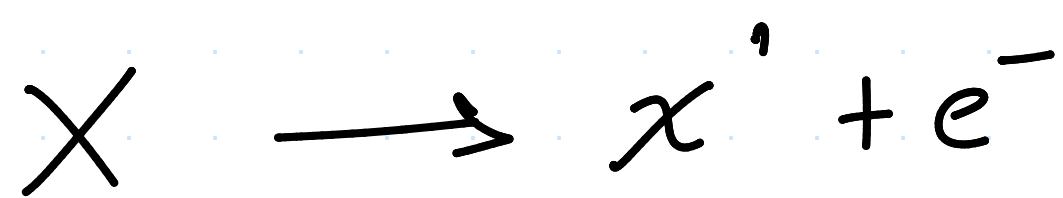


- 
- James Chadwick (1914) found that the electrons energy spectrum emitted in beta decay followed a continuous distribution.



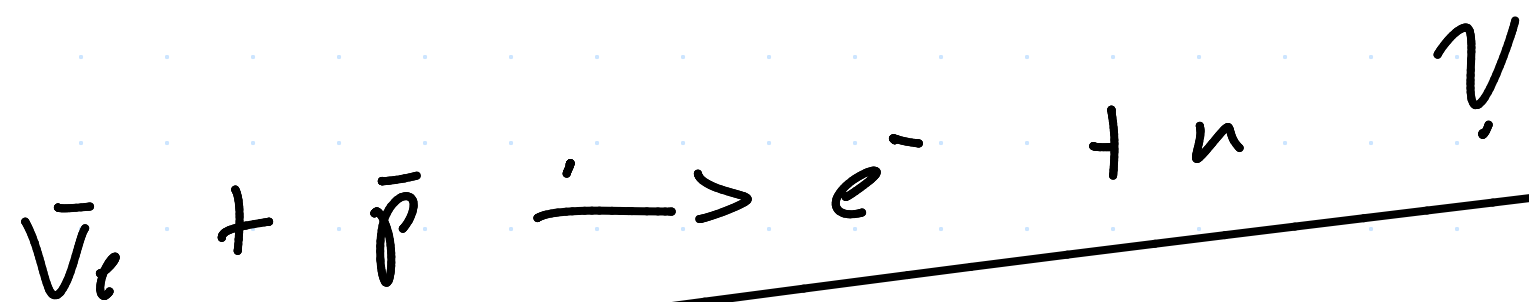
- Neutrinos, postulated by Pauli (1930)

where the neutrino is?

Detected for the first time in 1956 by C. Cowan & F.

Reines.

A water tank containing dissolved  $\text{CdCl}_2$  was employed. with the interaction involved described by the inverse beta decay



where can we find neutrinos?

- Neutrinos are created by Beta decay in the sun, in every star, accelerators, reactors, etc.

- Neutrino Interactions

Quasi-elastic scattering (QE)

neutrino - nucleus scattering

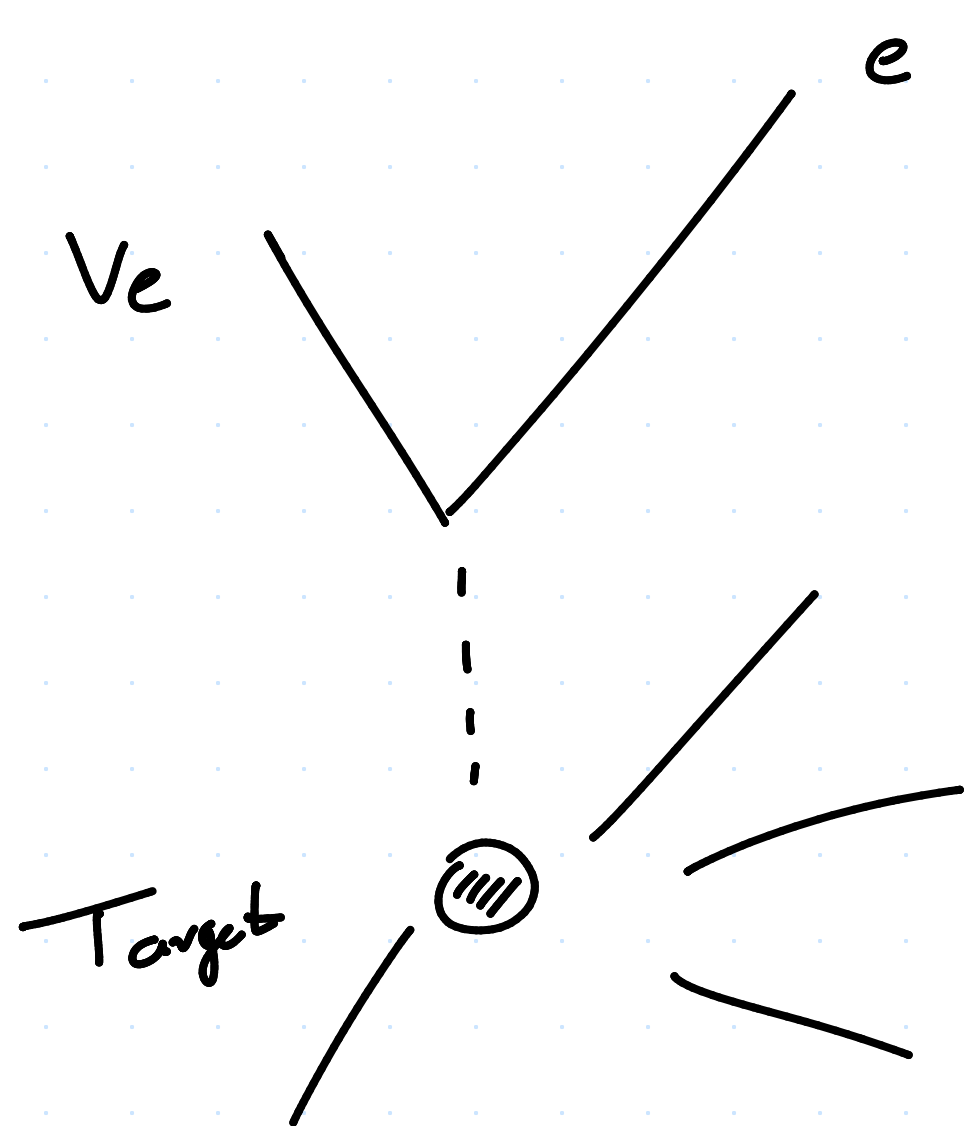
(RES)

...

ICARUS detector

ICARUS detector has an active total mass of 476 ton, total mass 760 ton...

NUMI  $\nu_e$  CC Inclusive selection using Pandora Reco



Results with Monte Carlo

Efficiency = selected signal / no cut signal

Purity = selected signal / (selected signal + selected background)