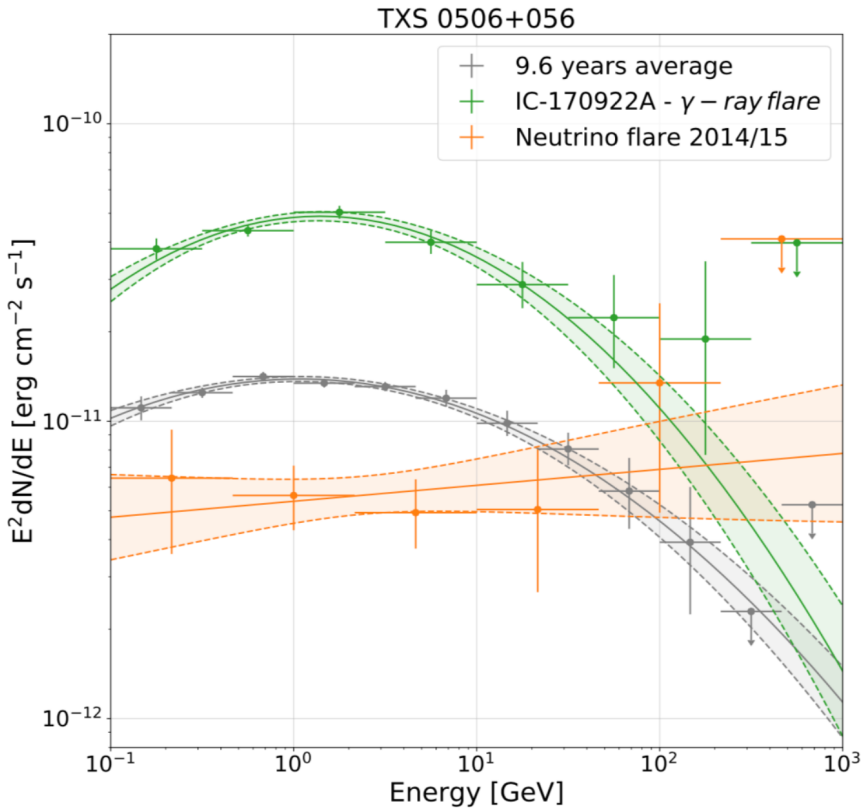
SEMINAR

TXT 0506+056



1 erg =0.624 TeV =6.24e11 eV

E^2 F(E) = 6 eV/cm^2/s
EF(E) =6 (eV/E) /cm^2/s

N=EF(E)*A*T

N(100 TeV) = $6*10^{-14}$ * 10^{10}cm^2 *$3*10^7$s /km^2/yr

N(100 TeV) =$2*10^4$ /km^2/yr

N(100 TeV) =(0.5-5) $2*10^4$ /km^2/yr

Neutrino detection

Neutrino cross section:

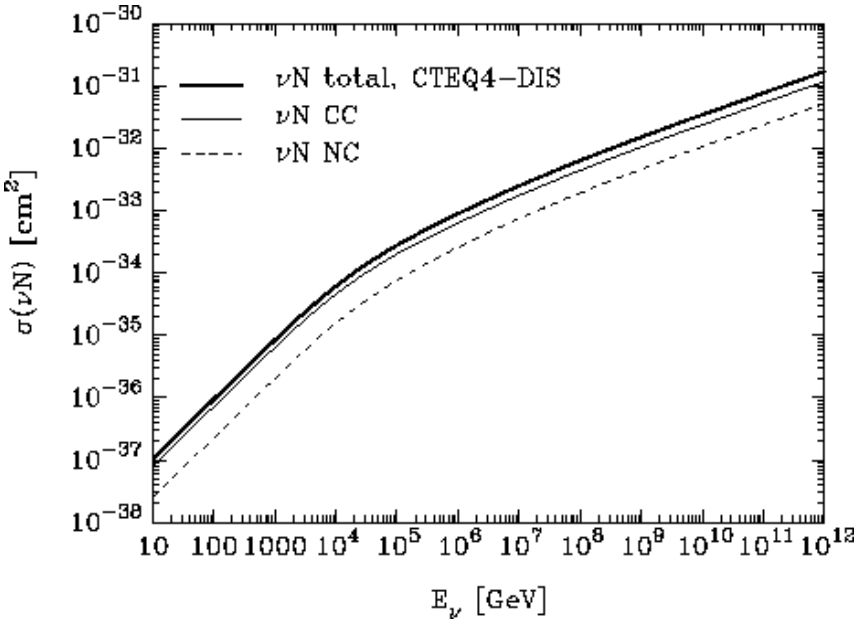
$$\sigma_{\nu p}(100\ TeV) = 3 \cdot 10^{-34}\, cm^2$$

Optical depth: which fraction of neutrinos interact near/in detector:

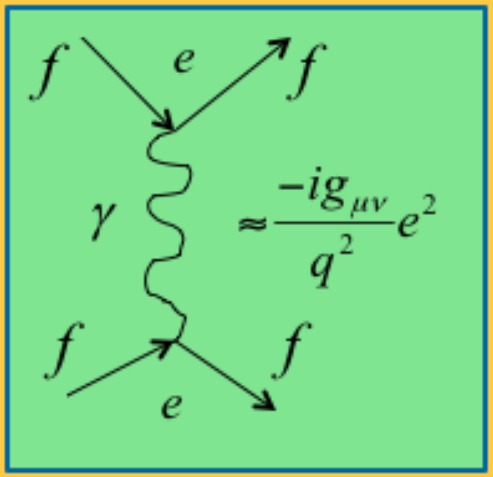
$$\tau = \sigma n_{ICE} R$$

$$n_{ICE} \sim 1g / cm^3 = 10^{24} / cm^3$$

$$\tau = \sigma n_{ICE} R \sim 3 \cdot 10^{-5}$$

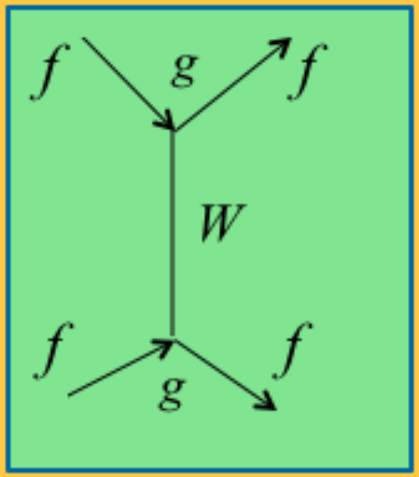


Electromagnetic



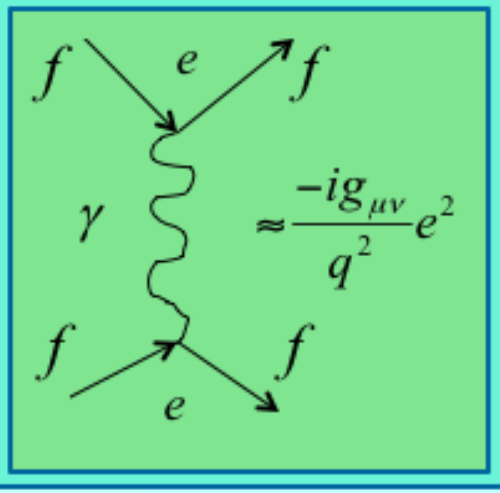
$$\approx \frac{-ig_{\mu\nu}}{q^2}e^2$$

Weak

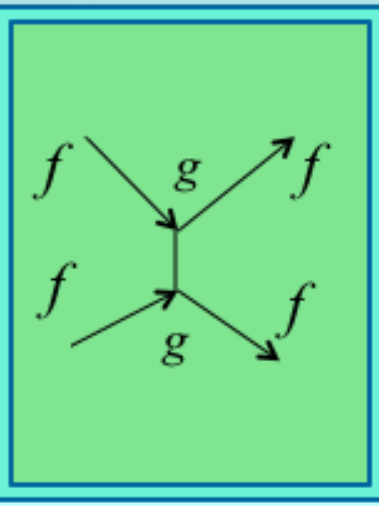


High Energy Matrix Element

$$\frac{-i(g_{\mu\nu}-q_\mu q_\nu/M^2c^2)}{q^2-M^2c^2}g^2$$



$$\approx \frac{-ig_{\mu\nu}}{q^2}e^2$$



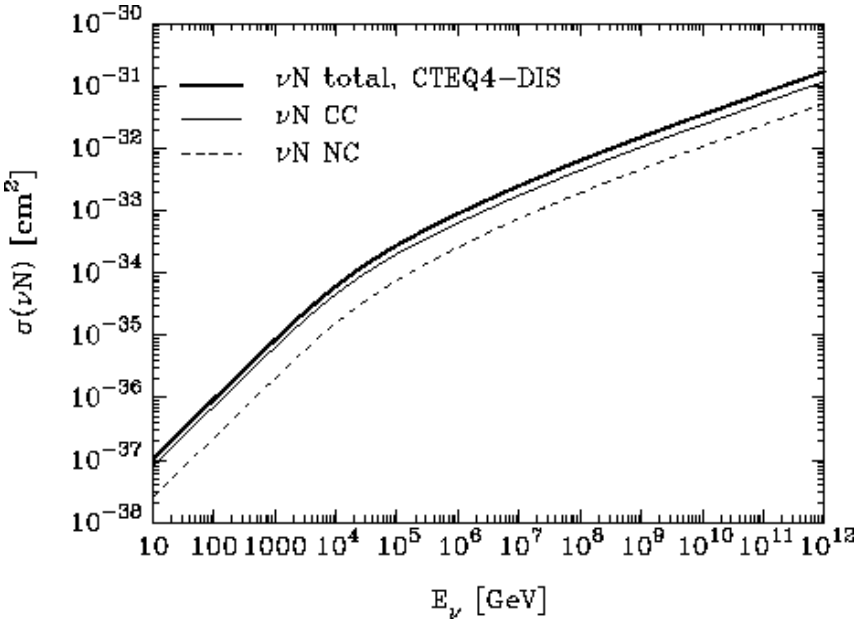
Low Energy Matrix Element

$$\frac{-i(g_{\mu\nu}-q_\mu q_\nu/M^2c^2)}{q^2-M^2c^2}g^2 \approx \frac{-ig_{\mu\nu}}{M^2c^2}g^2 \approx G_F^2$$

Neutrino flux from sources of gamma-rays

Neutrino cross section:

$$\sigma_{\nu p}(100\ TeV) = 3 \cdot 10^{-34}\, cm^2$$



Which fraction of neutrinos interact near/in detector:

$$\tau = \sigma n_{ICE} R \sim 3 \cdot 10^{-5}$$

Expected neutrino flux from pp reactions:

$$N_\nu \sim 0.6 / km^2 / yr$$