E570 X-ray

Normalization

by using the number of muons from
delayed-Kμ2 decay of "meta-stable state"

To determine the yield of X-rays per stopped kaons ....

$N_{K_{\mu 2}}$ **number of muons from Kμ2 decay**

$N_{stoppedK}$ **number of stopped kaons**

N_{X} **number of X-rays**

$\epsilon_{stoppedK}$ **selection eff. of stopped kaons**

$\epsilon_{BLC_{K^-}}$ **BLC tracking eff. of kaons**

$\epsilon_{PDC_{\mu}}$ **PDC tracking eff. of muons**

B_{X} **Yield of X-rays**

ϵ_{time} **survival rate of kaons in a time window**

f_{free} **free decay fraction (3.5±0.5%)**

$B_{K_{\mu 2}}$ **branching ratio of Kμ2 decay**

ϵ_{μ} **detection and selection eff. of muons**

ϵ_{X} **detection and selection eff. of X-rays**

ϵ_{vertex} **vertex reconstruction eff. (candidate)**

ϵ_{DAQ} **DAQ accept ratio**

$$N_{K_{\mu 2}} = N_{stoppedK}\epsilon_{stoppedK}\epsilon_{BLC_{K^-}} \cdot f_{free} \cdot B_{K_{\mu 2}}\epsilon_{\mu}\epsilon_{time}\epsilon_{PDC_{\mu}} \cdot \epsilon_{DAQ}$$

$$N_{\mathrm{X}} = N_{stoppedK}\epsilon_{stoppedK}\epsilon_{BLC_{K^-}} \cdot (1 - f_{free}) \cdot B_{\mathrm{X}}\epsilon_{\mathrm{X}}\epsilon_{vertex} \cdot \epsilon_{DAQ}$$

$$B_{\mathrm{X}} = \frac{N_{\mathrm{X}}}{N_{K_{\mu 2}}} \frac{f_{free}}{(1 - f_{free})} \frac{B_{K_{\mu 2}}\epsilon_{\mu}\epsilon_{time}\epsilon_{PDC_{\mu}}}{\epsilon_{\mathrm{X}}\epsilon_{vertex}}$$

$$\epsilon_{vertex} = (\mathrm{Ntrack}_{VDC_{charged}}.\mathrm{OR}.\mathrm{Ntrack}_{PDC_{charged}} - \mathrm{Ntrack}_{VDC_{charged}}.\mathrm{AND}.\mathrm{Ntrack}_{PDC_{charged}})/\mathrm{Ntrigger}$$