10/27/II

$$A_{exp} = \frac{\frac{N_+}{Q^+ t_D^+} - \frac{N_-}{Q^- t_D^-}}{\frac{N_+}{Q^+ t_D^+} + \frac{N_+}{Q^- t_D^-}}$$

→ Največ kot je t_D, največ popravkov prodelujemo, torej je ta v resnici Live-Time!

Če predpostavimo, da je: $\boxed{Q^+ = Q^-}$

Uvedem $t_D^+ \to T^+$

$$A_{exp} = \frac{\frac{N_+}{T^+} - \frac{N_-}{T^-}}{\frac{N^+}{T^+} + \frac{N_-}{T^-}}$$

$$\frac{T^+}{T^-} = 1 + \underset{|\tau| \ll 1}{\delta}$$

$$T^+ = T^- + \tau \cdot T^-$$

$$A_{exp} = \frac{\frac{N_+}{T^-(1+\tau)} - \frac{N_-}{T^-}}{\frac{N_+}{T^-(1+\tau)} + \frac{N_-}{T^-}} =$$

$$= \frac{\frac{N_+}{(1+\tau)} - N_-}{\frac{N_+}{1+\tau} + N_-} \approx \frac{N_+(1-\tau) - N_-}{N_+(1-\tau) + N_-}$$

= | Privzamem, da se ta razlika $(1-\tau)$ pozna bistveno bolj v števcu, kjer delam razliko, kot v imenovalcu, kjer je popravek minimalen | $\approx \frac{N_+(1-\tau) - N_-}{N_+ + N_-} =$

$$= \frac{N_+ - N_-}{N_+ + N_-} - \tau \cdot \overset{\approx \frac{1}{2}}{\frac{N_+}{N_+ + N_-}} \approx \underbrace{A^0_{exp}}_{\text{ideal}} - \frac{\tau}{2}$$

bi isto pesem naredili še za Q, bi dobili:

$$\frac{Q^+}{Q^-} = 1+\delta \quad ; \quad |\delta| \ll 1$$

$$\boxed{A_{exp} \approx A^{\circ}_{exp} - \frac{\delta}{2}}$$

Skupaj potem:

$$\boxed{A_{exp} \approx A^{\circ}_{exp} \underbrace{- \frac{\tau}{2} - \frac{\delta}{2}}}$$

V prvem redu, ko popravke (razmerja) nastopajo dovoljšni v asimetriji! s faktorjem $\frac{1}{2}$!)

Napake

$$\tau = \left(\frac{T^+}{T^-} - 1\right); \quad (\Delta\tau)^2 = \left(\frac{d\tau}{dT^+}\,\Delta T^+\right)^2 + \left(\frac{d\tau}{dT^-}\,\Delta T^-\right)^2$$

$$= \left(\frac{\Delta T^+}{T^-}\right)^2 + \left(\frac{T^+}{(T^-)^2}\cdot \Delta T^-\right)^2$$

$$T^+ \equiv |\text{Live time}| = \frac{N^+_{coda}}{N^+_{scaler}} \cdot \mathcal{H} \quad \left(\text{PS. corr}\right)$$

$$\Delta T^+ = \mathcal{H}\cdot\sqrt{\left(\frac{\Delta N^+_{coda}}{N^+_{scaler}}\right)^2 + \left(\frac{N^+_{coda}}{N^{+\,2}_{scaler}}\cdot \Delta N_{scaler}\right)^2} =$$

$$= \mathcal{H}\cdot\sqrt{\frac{\Delta N^{+\,2}_{coda} + N^2_{coda}\,\frac{\Delta N^2_{scaler}}{N^2_{scaler}}}{N^{+\,2}_{scaler}}}$$

$$\Delta N_{coda} = \frac{1}{\sqrt{N_{coda}}} \; ; \quad \Delta N_{scaler} = \frac{1}{\sqrt{N_{scaler}}}$$

$$\Delta T^{+} = \mathcal{H} \cdot \sqrt{\frac{\frac{1}{N_{coda}} + N_{coda}^{2} \cdot \frac{1}{N_{scaler}^{3}}}{N_{scaler}^{2}}}$$

$$= \underbrace{\mathcal{H} \cdot \frac{N_{coda}}{N_{scaler}}}_{= T^{+}} \sqrt{\frac{1}{N_{coda}^{3}} + \frac{1}{N_{scaler}^{3}}}$$

$$\boxed{\Delta T^{(\pm)} = T^{(\pm)} \cdot \sqrt{\frac{1}{N_{coda}^{3}} + \frac{1}{N_{scaler}^{3}}}}$$

c

$$\boxed{\rho = \frac{Q^+}{Q^-} - 1}$$

$$\Delta\rho = \sqrt{\left(\frac{d\rho}{dQ^+}\cdot\Delta Q^+\right)^2 + \left(\frac{d\rho}{dQ^-}\cdot\Delta Q^-\right)^2} =$$

$$= \sqrt{\left(\frac{\Delta Q^+}{Q^-}\right)^2 + \left(\frac{Q^+}{Q^{-2}}\,\Delta Q^-\right)^2}$$

$$Q^\pm = \frac{BCM^\pm - time \cdot offset}{calibration} = \left|\; time = \frac{\overset{\text{clock count}}{\downarrow}}{} \frac{cc}{1024} \right.$$

$$= \frac{BCM^\pm - \frac{cc}{1024}\cdot offset}{calibration}$$

$$\Delta Q = \sqrt{\left(\frac{1}{calibration}\cdot\Delta BCM\right)^2 + \left(\frac{offset}{calibration\cdot(1024)}\cdot\Delta cc\right)^2} =$$

$$= \frac{1}{calibration}\cdot\sqrt{(\Delta BCM)^2 + \left(\frac{offset}{1024}\cdot\Delta cc\right)^2} =$$

$$= \left|\; \Delta BCM = \frac{1}{\sqrt{BCM}}, \quad \Delta cc = \frac{1}{\sqrt{cc}} \;\right| =$$

$$= \frac{1}{calibration}\sqrt{\frac{1}{BCM} + \frac{offset}{1024\cdot cc}}$$

Ali so te napake to kar točne! To je zelo načelna napaka! D