

U-D-S APPROXIMATION

We introduce SU(3) octet and singlet currents

$$J_{\alpha}^a = \bar{\psi} \frac{1}{2} \lambda^a \gamma_{\alpha} (1 - \gamma_5) \psi = V_{\alpha}^a - A_{\alpha}^a$$

with λ^a ($a = 1, 8$) Gell-Mann matrices $\lambda^0 = \frac{2}{3} I$ and

$$\psi \equiv \begin{pmatrix} u \\ d \\ s \end{pmatrix} . \text{ and rewrite the currents as}$$

$$J_{\alpha}^{em} = V_{\alpha}^3 + \frac{1}{\sqrt{3}} V_{\alpha}^8$$

$$V_{\alpha}^{CC} = |V_{ud}| [V_{\alpha}^1 + i V_{\alpha}^2]$$

$$A_{\alpha}^{CC} = |V_{ud}| [A_{\alpha}^1 + i A_{\alpha}^2]$$

$$V_{\alpha}^{NC} = V_{\alpha}^3 - 2 \sin^2 \theta_W J_{\alpha}^{em} - \frac{1}{2} V_{\alpha}^s$$

$$A_{\alpha}^{NC} = A_{\alpha}^3 - \frac{1}{2} A_{\alpha}^s$$

where we isolate strangeness contributions

$$V_{\alpha}^s = V_{\alpha}^0 - \frac{2}{\sqrt{3}} V_{\alpha}^8 = \bar{s} \gamma_{\alpha} s$$

$$A_{\alpha}^s = A_{\alpha}^0 - \frac{2}{\sqrt{3}} A_{\alpha}^8 = \bar{s} \gamma_{\alpha} \gamma_5 s$$