ISOSPIN VIOLATION IN SEMILEPTONIC DECAYS.

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CANADA

$\Sigma\Lambda$ MIXING

- When isospin is not conserved:
  $\Lambda = \Lambda_8 \cos\varphi + \Sigma_8 \sin\varphi$
  $\Sigma = -\Lambda_8 \sin\varphi + \Sigma_8 \cos\varphi$
- $\sin\varphi = -(\mathrm{sqrt}(3)/4)*(m_d - m_u)/(m_s - m_{av}) = -0.015$
- Ref: Dalitz and von Hippel(1964) MacFarlane and Sudarshan(1964) Isgur(1980), Leutwyler et al(1982)
- review: Donoghue,Ann.Rev.Nucl(1989)

EFFECTS OF MIXING ON SEMILEPTONIC DECAYS

$$R(\phi) = \Gamma(\Sigma(+)=>\Lambda\tilde{e}\nu)/\Gamma(\Sigma(-)=>\Lambda e\bar{\nu})$$

$$= R(0)*(1- 3.95\phi) = R(0)*(1-0.06)$$

$$=0.65$$

a six percent diminution relative to no mixing. Present data is not good enough to check this value.(**Exp:R=.645+/-.18)**

Ref:Karl,Phys.Lett.B328,149(1994)
Henley&Miller,Phys.RevD50,7077(1994)

g_V/g_A for $\Sigma \Rightarrow \Lambda e \nu$

FOR ZERO MIXING

$\phi = 0$

g_V VANISHES

(Cabibbo and Gatto)

FOR GENERAL ϕ

$g_V/g_A = (\sqrt{3}/D)\phi$

$= -0.03$ ($\Sigma(-)$)

Karl(1994)☺

disagrees with expt!