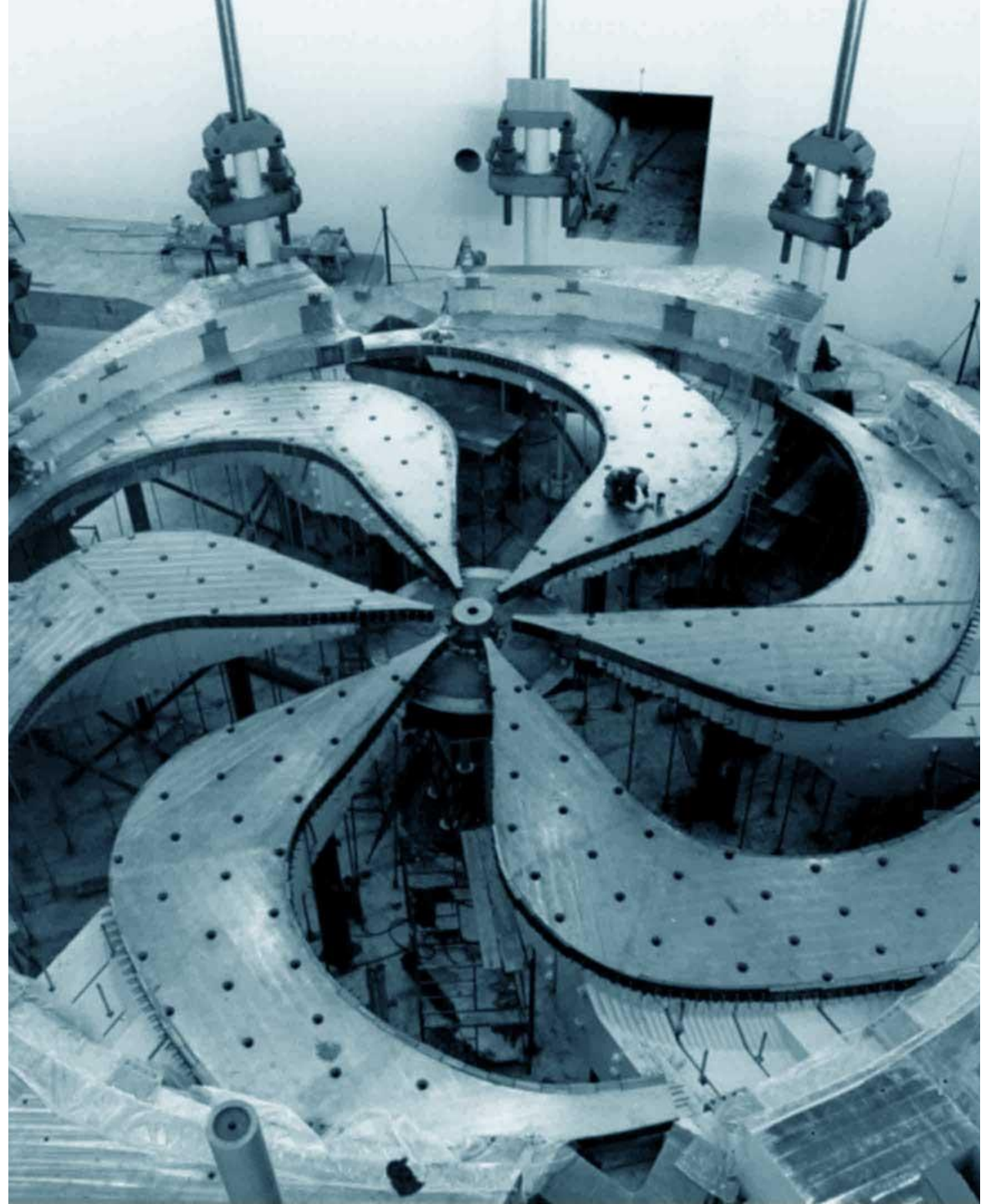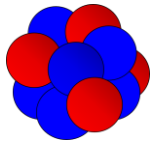# V_{ud} via nuclear theory

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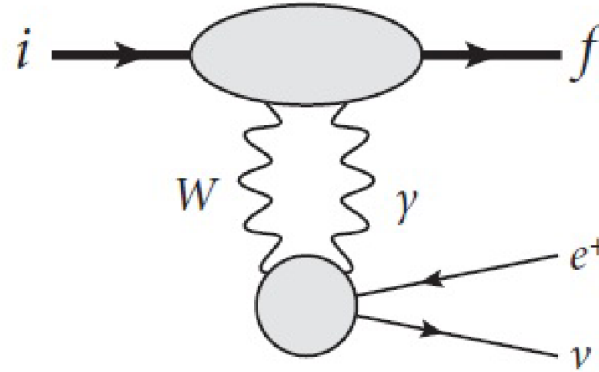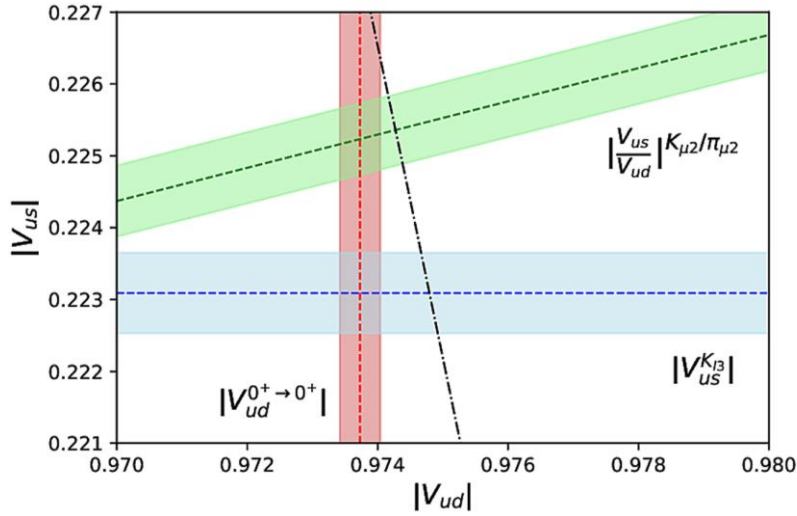
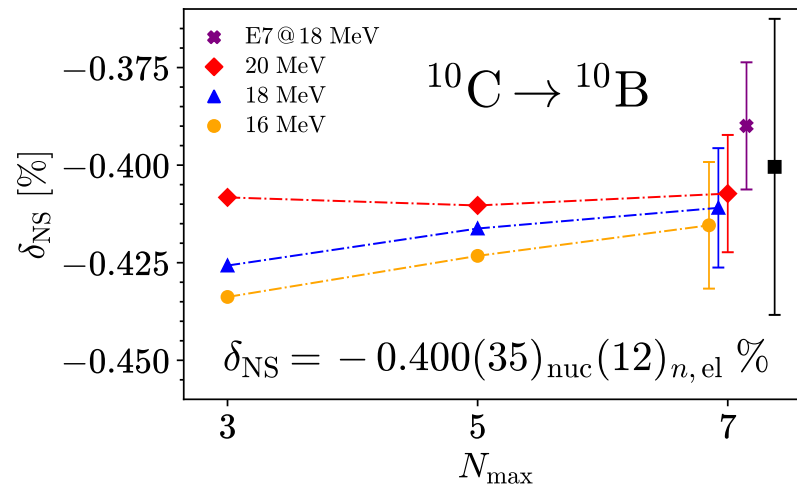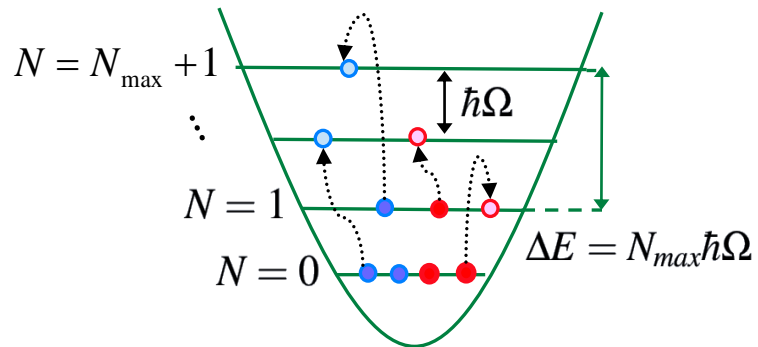Discovery, accelerated

$SU(3)_C$ ← Standard Model → $SU(2)_L \times U(1)_Y$

Haxton et al. (2007)
Seng et al. (2023)

$$\mathcal{F}t = ft(1 + \delta'_R)(1 - \delta_C + \delta_{NS})$$

Barrett et al. (2013)
Haydock (1974)

$N = N_{\max} + 1$

$\hbar\Omega$

$N = 1$

$N = 0$

$\Delta E = N_{max}\hbar\Omega$

$^{10}\mathrm{C} \rightarrow {}^{10}\mathrm{B}$

- E7 @ 18 MeV
- 20 MeV
- 18 MeV
- 16 MeV

$\delta_{\mathrm{NS}} = -0.400(35)_{\mathrm{nuc}}(12)_{n,\mathrm{el}}$ %

δ_{NS} [%]

$N_{\max}$

Chiral Effective Field Theory

Entem et al. (2017)   Weinberg (1991)
Somà et al. (2020)   Epelbaum (2009)

$$H \left| \Psi_A^{J^\pi T} \right\rangle = E^{J^\pi T} \left| \Psi_A^{J^\pi T} \right\rangle$$