

Classes of New Physics models emerging

that connect flavour dynamics for D and K
much more on a 'par level' than the SM

thus opening the gateways for **observable NP effects** in
~~CP~~ and rare decays in $\Delta C \neq 0$

Grossman et al., Buras et al., Petrov et al. , others (?)

Just one example

LHT (=Littlest Higgs Model with T parity)

- designed to `delay the day of reckoning' --

i.e. reconcile SM electroweak quantum corrections with NP to emerge directly at the LHC

- will never win a prize for mathematical elegance

- flavour dynamics not part of the motivation!

👉 even so: LHT $\neq$ MFV with `relatively' few flavour param.

- LHT could generate

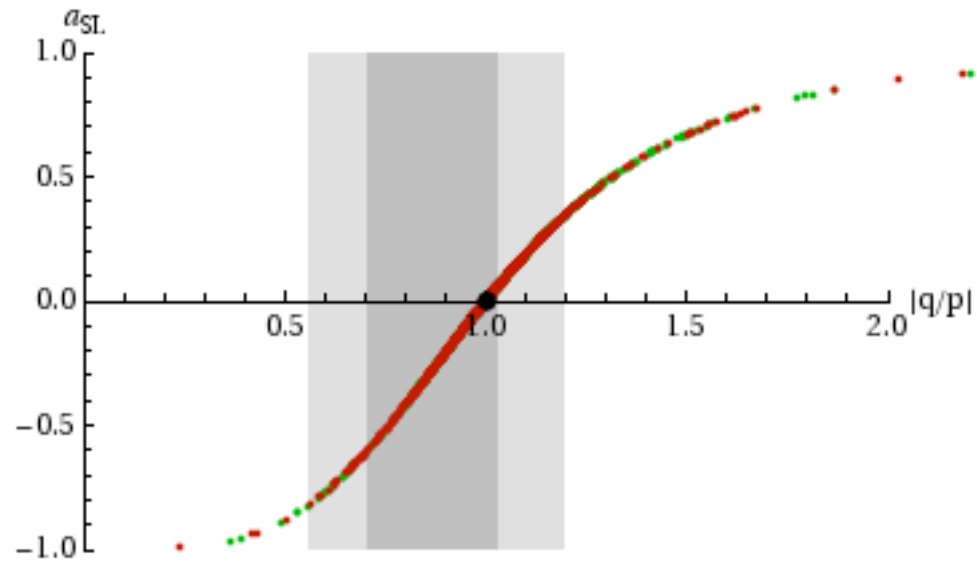
- the observed value of x_D without violating any other bound

- exhibiting a weak phase only moderately constrained!

- moderate impact on $B_s \rightarrow \psi\phi$, $K \rightarrow \pi\nu\nu$

Buras et al., Okada et al.

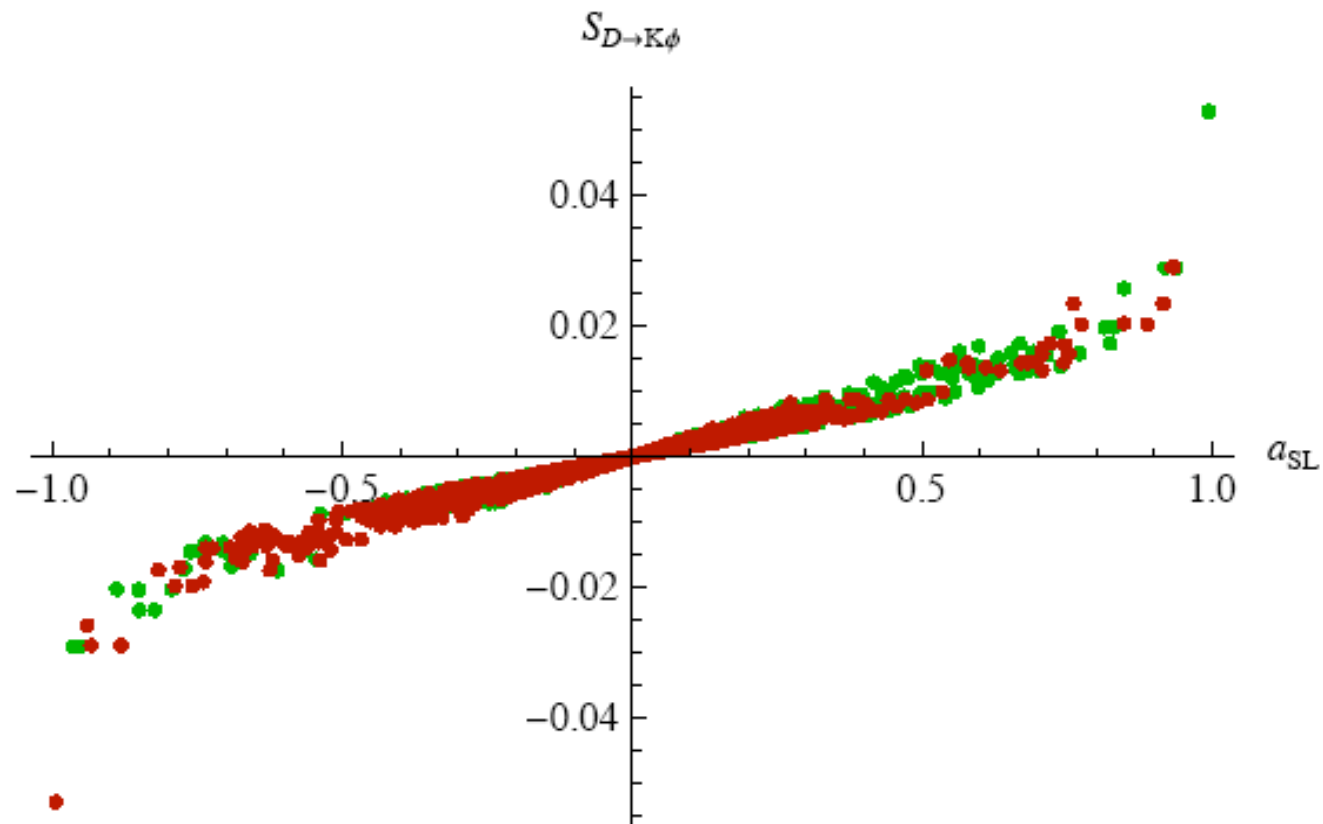
Blanke, Buras, Recksiegel, IB

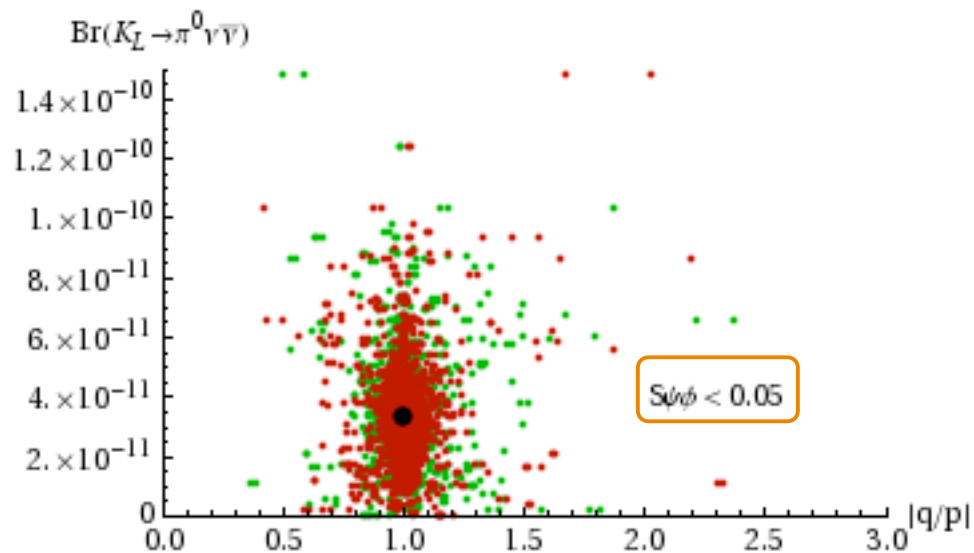
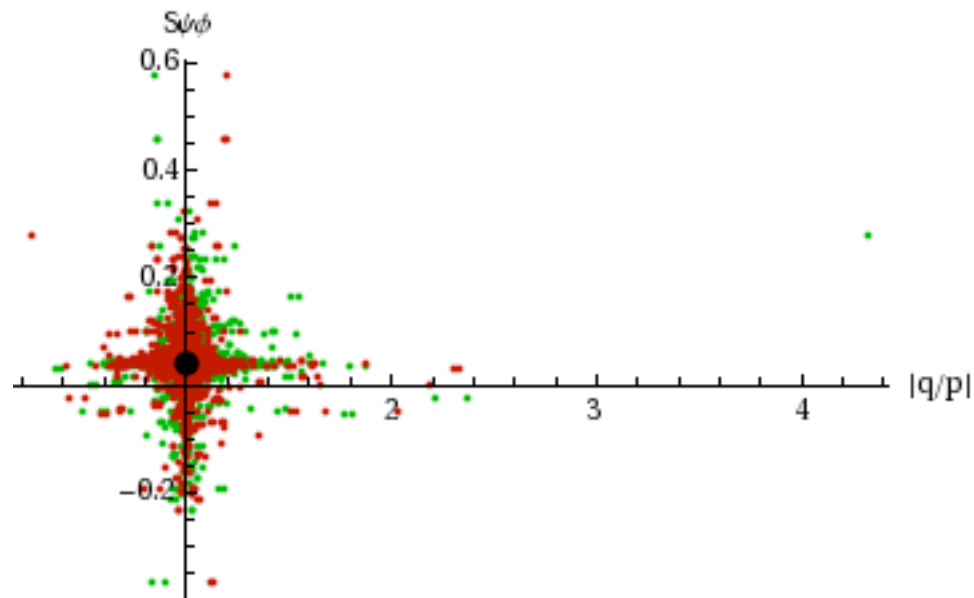


Yes, very few wrong sign leptons in SL D^0 decays --
but their CP asymmetry could be huge $\neq$ SM!

$$D^0 \rightarrow K_S \phi$$

Oscillation-induced ~~CP~~: $S(D^0 \rightarrow K_S \phi)$





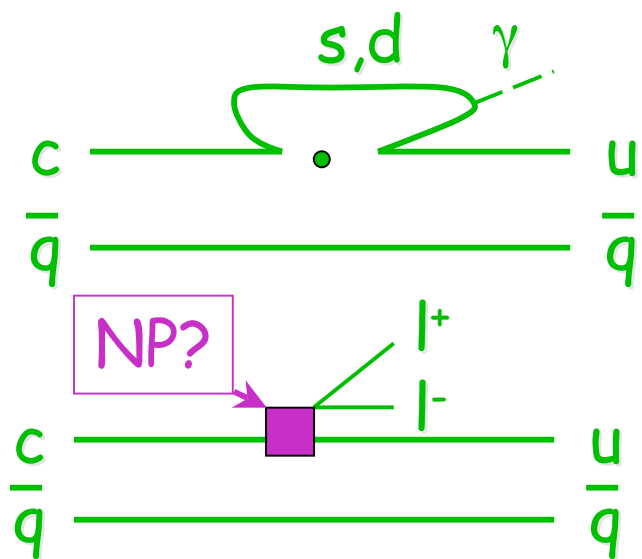
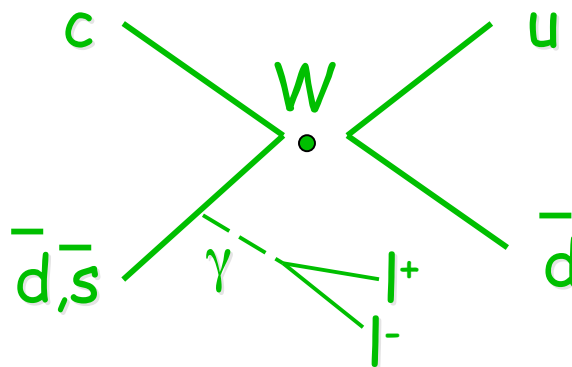
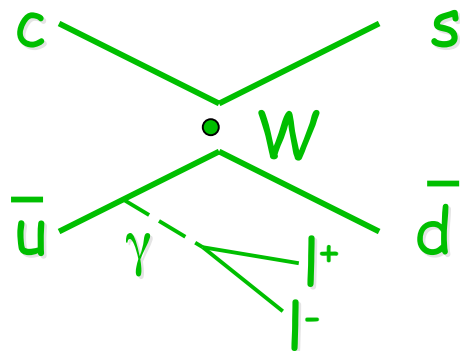
Even *if* $B_s \rightarrow \psi\phi$ SM-like
still large footprint
possible in ~~CP~~ in D decays

On Rare Charm Decays

"Apparent" FCNC

$$D^0, D^+, D_s^+ \rightarrow l^+ l^- X_q, X_q = h, h_1 h_2, h_1 h_2 h_3$$

WA



long distance dynamics!

not under sufficient theoretical control!

Measuring rates and spectra

☹ Rather skeptical about establishing NP there

(maybe an outside chance with

$$D^0, D_{(s)}^+ \rightarrow l^+ l^- K/K^* / \dots \text{ vs. } \pi/\rho/\dots$$

if NP does not follow Cabibbo pattern)

-- unless find forward-backward or ~~CP~~ asymmetries

😊 can learn about hadronization effects

😊 input info for T odd moments & ~~CP~~ in $D \rightarrow K^+ K^- \mu^+ \mu^-$

Cleaner situation theoretically for

$$D^0 \rightarrow 2\mu, \gamma\gamma$$

CDF/D0/LHCb

B/D Factory

