SEE SAW 1979 → 2004
KEK, Febr. 23-25, 2004

SUGRA 20 (2003)
LOW-ENERGY
SUPERSYMMETRY

SeeSaw 25 (2004)
SEESAW

SUSY SEE SAW

1986

and FCNC

A. Masiero

Padova

- STRONG, WEAK and NO SUSY FLAVOR BLINDNESS
- SUSY SEE SAW and LFV
- HADRONIC $\leftrightarrow$ LEPTONIC FCNC in SUSY GUTs

CONVERGENCE TO CKM SM PHYSICS

? ↓ ?

FLAVOR BLINDNESS OF LOW ENERGY NEW PHYSICS

i.e. CONTRIBUTIONS OF NEW PHYSICS TO FC PROCESSES CONFINED TO ADDITIONAL LOOPS WITH EXCHANGES OF NEW PARTICLES BUT GOVERNED BY THE CKM MIXINGS

$\Rightarrow$ NO NEW "FLAVOR STRUCTURES" AT LOW ENERGY

THIS IS A POSSIBILITY, BUT DATA SO FAR DO NOT NECESSARILY IMPLY SUCH STRICT LOW ENERGY FLAVOR BLINDNESS

ON SUSY FLAVOR BLINDNESS

1. STRONG FLAVOR BLINDNESS

→ MSSM with MINIMAL FLAVOR and CP VIOLATIONS

Bertolini, Borzumati, A.M., Ridolfi ; Gabrielli, Giudice ; Cho, Misiak, Wyler ; Ali, London ; Goto et al ; Misiak, Pokorski, Rosiek ; Ciuchini, Giudice, Degrassi, Gambino D'Ambrosio, Giudice, Isidori, Strumia ; Buras et al.

⇒ FLAVOR and CP ≠ GOVERNED BY CKM

⟹ SUSY ONLY MODIFIES "TOP CONTRIBUTION" IN THE EFFECTIVE HAMILTONIAN

* small $\tan\beta$ (<10) : once $b \to s\gamma$, m_H and direct search bounds are applied, UT fit is NOT distinguishable from the SM one (see next slide)

→ still possible to have A_{CP} in $b \to s$ transitions ≠ from SM (Kagan Neubert) (Baek)

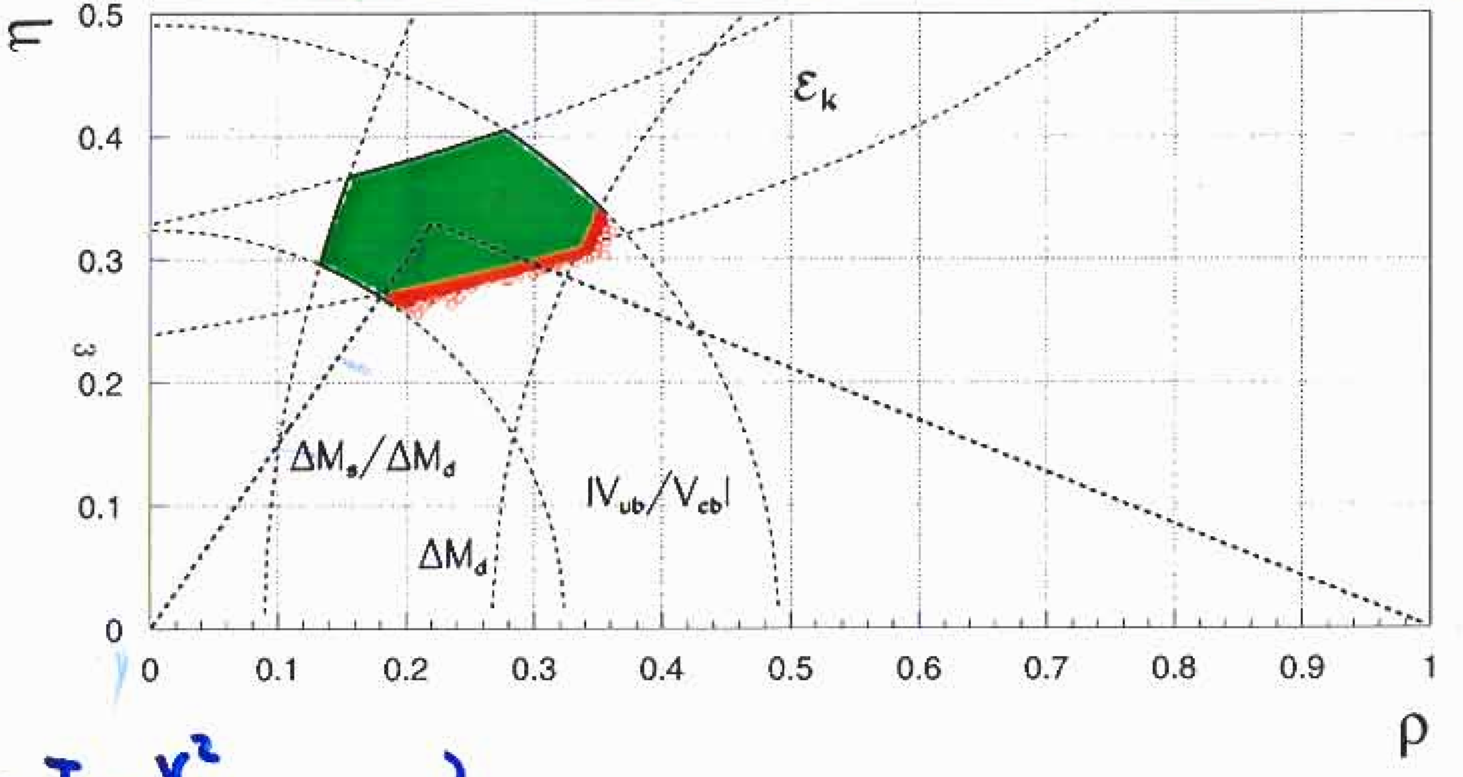
* large $\tan\beta$: big effects possible in $B_s \to \mu^+\mu^-$

SM BR $\sim 4 \cdot 10^{-9}$ → SUSY 10^{-6} Babu, Kolda ; Chankowski, Slawianowska ; Dedes et al ; Isidori, Retico ; Bobeth et al ; Huang et al ;

BARTL et al.

- red dots: departure from SM due to the exchange of mSUGRA particles

BARTL, GAJDISIK, LUNGHI, A. M., POROD, STOCKINGER, STREMNITZER, VIVES



(inclusion of 2-loop RGE running $M_{GUT} \to M_W$)

$$\left.\begin{array}{l} \varepsilon_K \to \mathrm{Im}\, V_{td}^2 \\ \Delta m_d \to \mathrm{Re}\, V_{td}^2 \\ a_{J/\psi K_S} \to \mathrm{Im}\, V_{td} \end{array}\right\} \Rightarrow V_{td} \qquad V_{ub}$$

Ex :

- $B_s - \overline{B}_{\bar{s}}$ mixing $\quad \Delta m_{B_s} \simeq (28 \pm 5) \dfrac{\Delta m_{B_d}}{\underbrace{\left[(1-\rho)^2 + \eta^2\right]}}$

Branco, Cho, Kizukuri, Oshimo ;
Branco, Grimus, Lavoura ;
Brignole, Feruglio, Zwirner ;
Misiak, Pokorski, Rosiek ; Chankowski, Pokorski

can be smaller than in SM

new MSSM contributions to Δm_{B_d} and ε_K

Ali-London : effects up to 60% of the SM contribution

- CP $\neq$ in $B \to X_s + \gamma$

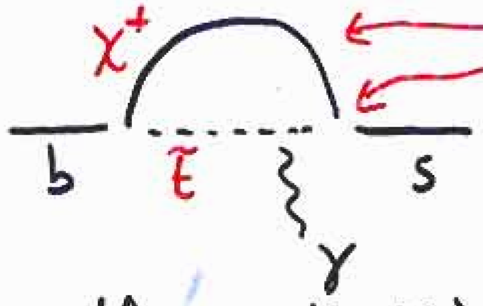
$A_{CP}^{b \to s \gamma}$ in SM is very small < 1 %

(because of a combination of CKM and GIM suppressions)

Soares ; Kagan, Neubert ; Ali, Asatrian, Greub

in Constrained MSSM :

Kagan, Neubert



φ_A, φ_μ SUSY CP$\neq$ phases

if $\varphi_\mu = 0$ (to avoid severe problems with d_e^n)

$\Rightarrow$ $A_{CP}^{b \to s \gamma}$ can still grow up to few (4 or 5) %

Aoki, Cho, Oshimo

if both $\varphi_A, \varphi_\mu \neq 0$ $\Rightarrow$ $A_{CP}^{b \to s \gamma}$ can reach 10 %

Chua, He, Hou

Baek, Ko

2. WEAK FLAVOR BLINDNESS

SUSY BREAKING MECHANISM IS FLAVOR BLIND

$$\left\{\begin{array}{lll} - m_0^2 & \text{UNIVERSAL SCALAR MASSES} \\ - A & \text{" TRILINEAR TERMS} \\ - M & \text{" GAUGINO MASS} \end{array}\right.$$

BUT IN THE RUNNING FROM THE SUPERLARGE SCALE where SOFT SUSY BREAKING TERMS APPEAR IN SUPERGRAVITY DOWN TO M_W NEW CONTRIBUTIONS ARISE SO THAT FLAVOR AND CP VIOLATION ARE NOT GOVERNED BY THE CKM MATRIX Ex: SUSY SEESAW

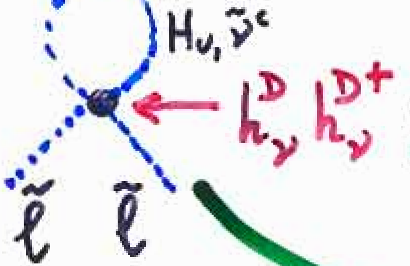
NO FLAVOR BLINDNESS

⇒ SUSY BREAKING MECHANISM "FEELS" FLAVOR ⇒ FLAVOR SYMMETRIES TO "PROTECT" FCNC ?

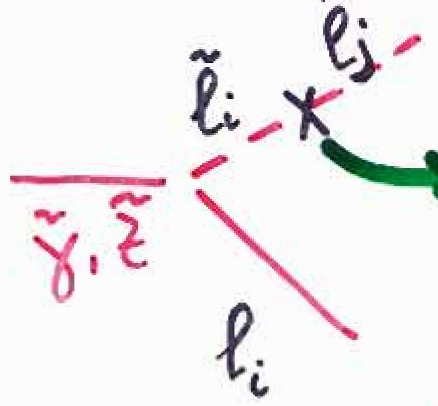
SUSY SEE SAW

→ possible example of SUSY WEAK FLAVOR BLINDNESS

$$W = h_L\, L H_d e^c + h_\nu^D\, L H_u \nu^c + M \nu^c \nu^c$$



$$\Rightarrow \; M^2_{\tilde{\ell}_L \tilde{\ell}_L^*} = \tilde{m}_0^2 \mathbb{1} + m_\ell m_\ell^+ + c\, m_\nu^D m_\nu^{D+}$$



$$\Delta^\ell_{ij} = c\left(U\, m_\nu^D m_\nu^{D+}\, U^+\right)_{ij}$$

F. BORZUMATI, A. MASIERO 1986

(after discussions with W. Marciano and A. Sanda)

at that time: for $m_\nu^D \sim$ 10-20 GeV and

$U \sim V_{CKM} \Rightarrow BR(\mu \to e\gamma) \sim 10^{-12} - 10^{-13}$

and also μ-e conversion in nuclei close to the exp. bound ($\tau \to \mu\gamma$ later by Blazek, King)

1986 → 2004: much progress in "ν knowledge"

$U,\ m_\nu^D \overset{?}{\Longleftrightarrow}$ PHYSICAL ν MASSES and MIXINGS

INFO FROM ν masses and mixings is NOT sufficient to fully determine the U, m_ν^D seesaw parameters CASAS, IBARRA '01

TOP-DOWN APPROACH (specific SUSY GUT models and/or flavor symmetries)

HISANO, NOMURA, YANAGIDA ; KING, OLIVEIRA ;
ELLIS, GOMEZ, LEONTARIS, LOLA, NANOPOULOS ;
BAEK, GOTO, OKADA, OKUMURA ; HISANO, TOBE ;
CARVALHO, ELLIS, GOMEZ, LOLA ; GONZALEZ FELIPE, JOAQUIM ;
ROMANINO, STRUMIA ; KAGEYAMA, KANEKO, SHIMOYAMA, TANIMOTO ;
DEPPISCH, PAES, REDELBACH, RUCKL, SHIMIZU ; FALCONE ;
BABU, DUTTA, MOHAPATRA ; HAMAGUCHI, KAKIZAKI, YAMAGUCHI ;
HISANO, SHIMIZU ; HUANG, LI, LIAO ; FUKUYAMA, KIKUCHI, OKADA ;
DUTTA, MOHAPATRA ; FENG, HUANG, LI, ZHANG, ZHAO ; KING, PEDDIE ;
ILLANA, MASIP ; BABU, ENKHBAT, GOGOLADZE ; TOBE, WELLS, YANAGIDA
IBARRA, ROSS ;
SATO, TOBE, YANAGIDA ; SATO, TOBE ; BI ;
ELLIS, RAIDAL, YANAGIDA ; BARR ; A.M., VEMPATI, VIVES

BOTTOM-UP APPROACH (specif parametrizations of low-energy unknowns)

DAVIDSON, IBARRA ; LAVIGNAC, MASINA, SAVOY ; ELLIS, HISANO, RAIDAL, SHIMIZU
PASCOLI, PETCOV, RODEJOHANN ; PETCOV, PROFUMO, TAKANISHI, YAGUNA ;
PETCOV, PASCOLI, YAGUNA

LFV $\begin{cases} \text{– how large } h_\nu^{\text{DIRAC}} \\ \text{– how large } U \rightarrow \text{mismatch in the diagonalization of } m_\ell m_\ell^+ \text{ and } m_\nu^D m_\nu^{D+} \end{cases}$

from $h_\nu L \nu^c H_u$ and $M \nu^c \nu^c$

CASAS, IBARRA
LAVIGNAC, MASINA, SAVOY;
CARVALHO, ELLIS, GOMEZ, LOLA

$$M_\nu = h_\nu^T M^{-1} h_\nu v_u^2 \equiv m_\nu^{DT} M^{-1} m_\nu^D$$

$$U_{MNSP}^T M_\nu U_{MNSP} = \text{diag}(m_{\nu_1} \; m_{\nu_2} \; m_{\nu_3})^*$$

$$U_{MNSP} \sim \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1/\sqrt{2} & 1/\sqrt{2} \\ 0 & -1/\sqrt{2} & 1/\sqrt{2} \end{pmatrix}$$

single maximal mixing (ν_{atm} sector)

$$U_{MNSP} \sim \begin{pmatrix} 1/\sqrt{2} & 1/\sqrt{2} & 0 \\ -1/2 & 1/2 & 1/\sqrt{2} \\ \frac{1}{2} & -1/2 & 1/\sqrt{2} \end{pmatrix}$$

bimaximal mixing ($\nu_{atm} + \nu_{solar}$ LMA)

* hierarchical m_ν : $\begin{cases} m_{\nu_1} \sim 0 \\ m_{\nu_2} \sim \sqrt{\Delta m^2_{sol}} \\ m_{\nu_3} \sim \sqrt{\Delta m^2_{atm}} \end{cases}$

SO(10) $\Rightarrow$ LARGE h_t implies that

AT LEAST ONE h^D_ν IS LARGE

(if only $\underline{10}$'s $\Rightarrow$ quark-lepton Pati-Salam symm. $\Rightarrow h_u = h^D_\nu$

$\rightarrow h_t = h^D_{\nu_3}$

but it holds true even if $\underline{126}$, $\underline{120}$ are present)

LINK U (matrix diagonalizing $m^D_\nu m^{D+}_\nu$)

U_{MNSP} (matrix diagonalizing M_ν)

depends on $M \rightarrow M_{\nu^c \nu^c}$

two "extreme" cases:

$U = U_{MNSP}$ (ex. $M \propto \mathbb{1}$)

$U = V_{CKM}$ (then M has a non-trivial structure to allow for the large mixings in U_{MNSP}.

SO(10) $\rightarrow$ Buchmuller, Wyler

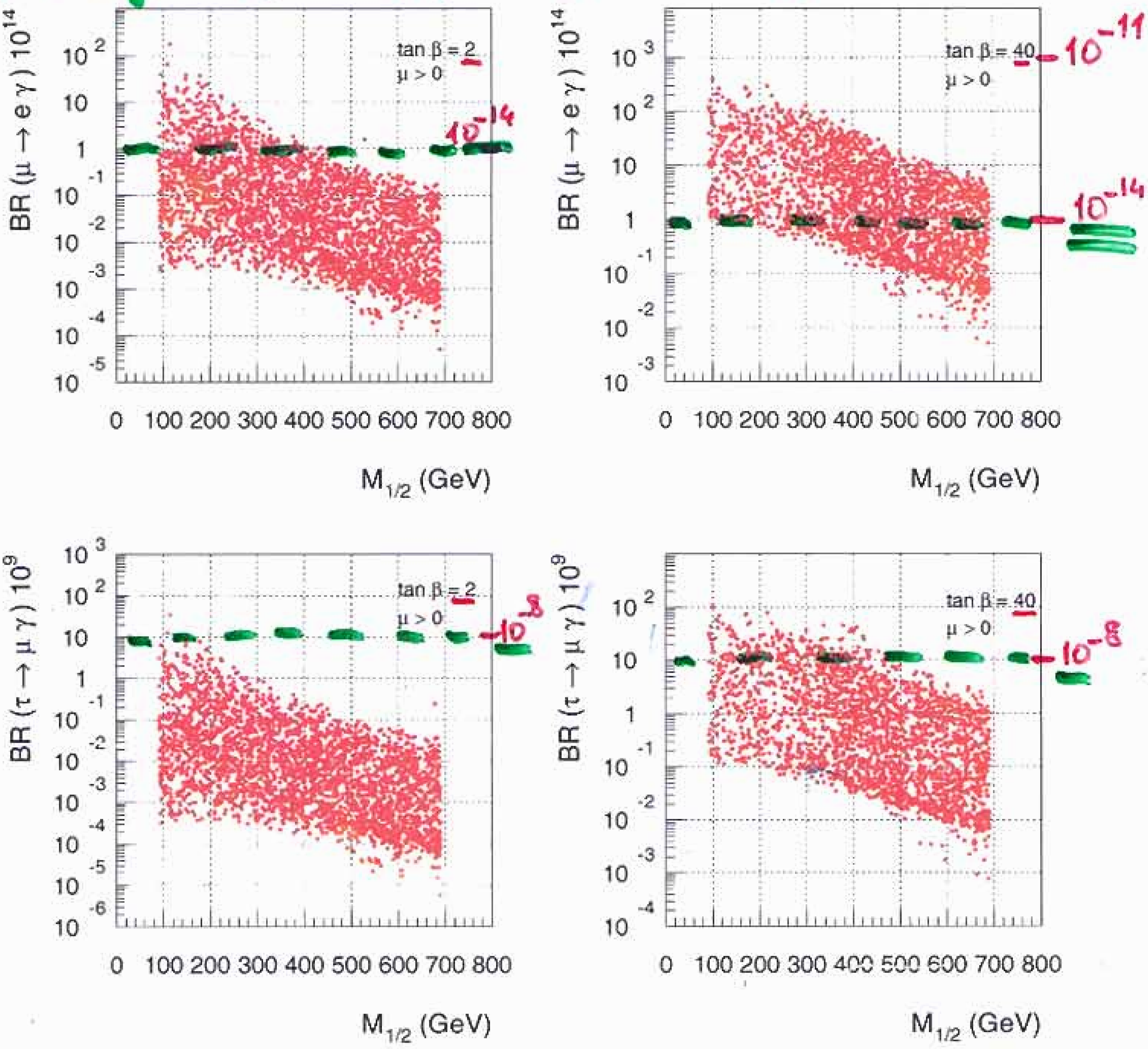
SUSY SO(10) $\begin{cases} \mu \to e\gamma \\ \tau \to \mu\gamma \end{cases}$

A.M., VEMPATI, VIVES

"UNFAVOURABLE CASE" : M_ν^{DIRA} DIAGONALIZED BY CKM

$\tau \to \mu\gamma \propto (CKM)_{23} \times (CKM)_{33} \times h_t^2$

$\mu \to e\gamma \propto (CKM)_{13} \times (CKM)_{23} \times h_t^2$ ($(CKM)_{13} \hookrightarrow 0.04$)

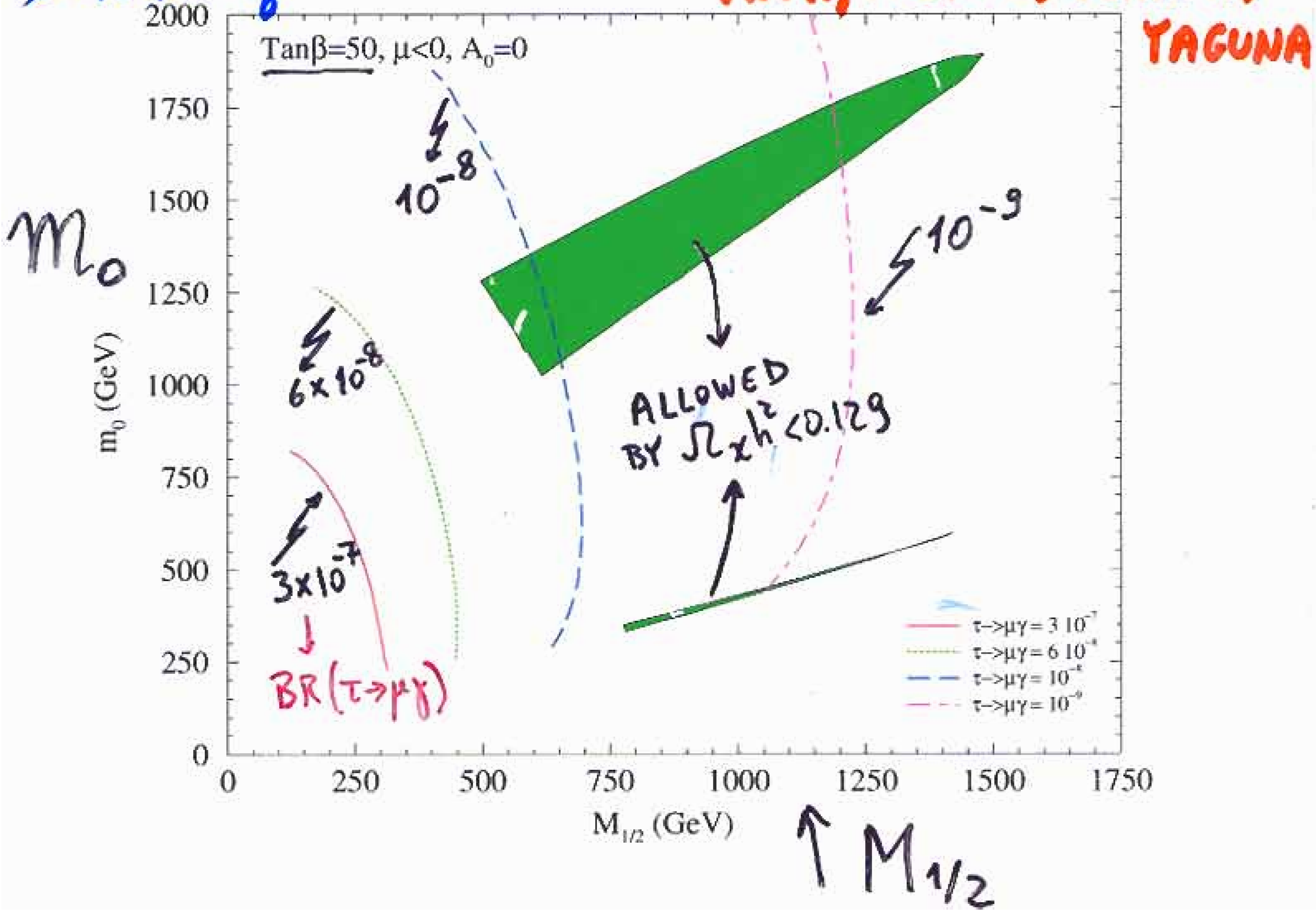


PROBING THE $M_{1/2} - m_0$ SPACE OF CMSSM WITH SEESAW MECHANISM

→ CONSTRAINTS FROM DIRECT SEARCHES, $\Omega_{CDM} h^2 < 0.129$ (WMAP) AND $\tau \rightarrow \mu + \gamma$ reach

Campbell, Maybury, Murakami; Blazek, King

A.M., PROFUMO, VEMPATI, YAGUNA

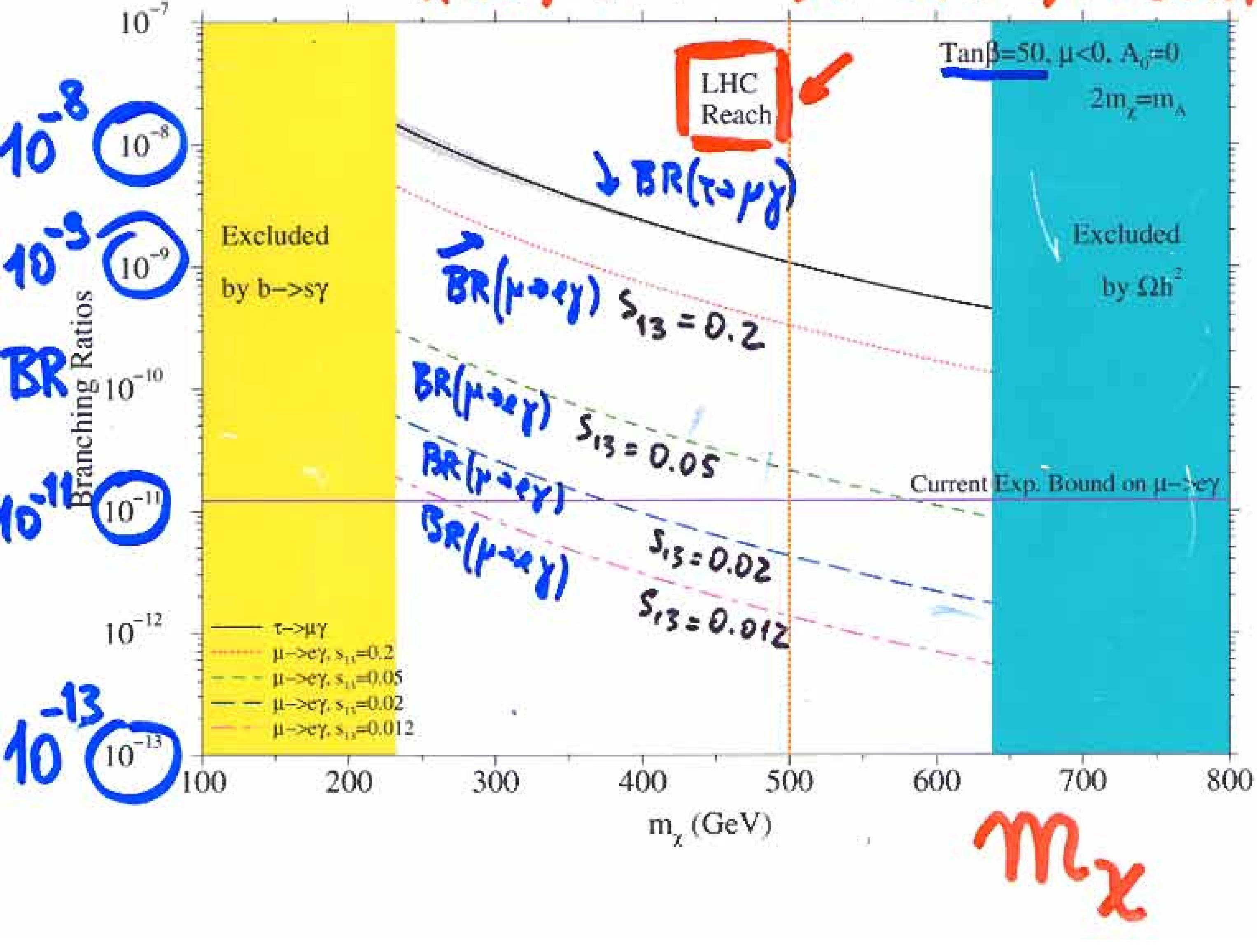


BR($\tau \to \mu\gamma$) and BR($\mu \to e\gamma$)

in the central part of the funnel region in the CMSSM to respect $\Omega_\chi h^2 < 0.129$ (WMAP)

(compared to LHC reach at ~100 fb^{-1} in this region of CMSSM param. space)

A.M., PROFUMO, VEMPATI, YAGUNA



SUSY SO(10)

A.M., VEMPATI, VIVES

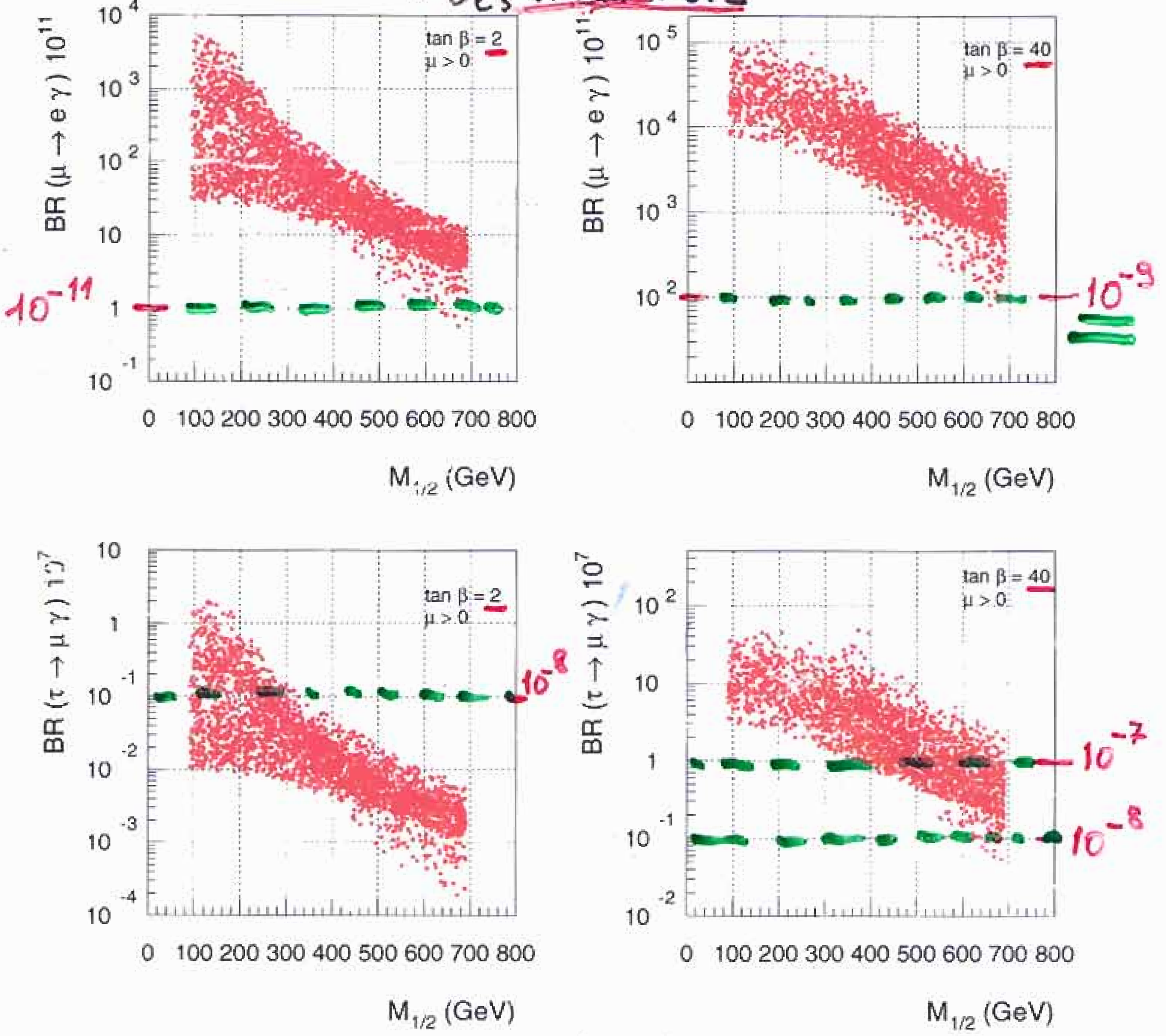
$$\begin{cases} \mu \to e\gamma \\ \tau \to \mu\gamma \end{cases}$$

"FAVOURABLE CASE" : M_ν^{DIRAC} DIAGONALIZED BY MNS MATRIX → MAXIMAL MIXING

$$\tau \to \mu\gamma \propto (MNS^L)_{23} \times (MNS^L)_{33} \times h^2(t)$$

$$\mu \to e\gamma \propto (MNS^L)_{13} \times (MNS^L)_{23} \times h^2(t)$$

↪ U_{e3} taken ~ 0.2



SEE ALSO: SLEPTONARIUM by MASINA-SAVOY

LARGE ν MIXING
+
LARGE h_ν^D
$\Rightarrow$ LARGE Δ^ℓ_{LL}
LARGE LFV

+

LEPTON - QUARK UNIFICATION $\Rightarrow$ LARGE Δ^ℓ_{LL} $\downarrow$ LARGE Δ^q

$\downarrow$

$$\begin{pmatrix} d_R \\ d_R \\ d_R \\ \ell \\ \nu \end{pmatrix} \Rightarrow$$ LARGE $(\Delta^\ell_{LL})_{23}$ translates into LARGE $(\Delta^d_{RR})_{23}$

in SU(5) MOROI (assume one large h_ν^D)

in SO(10) CHANG, A.M., MURAYAMA ($h_t \leftrightarrow h^D_{\nu_3}$ Pati-Salam symm.)

Akama, Kiyo, Komine, Moroi ; Hisano, Moroi, Tobe, Yamaguchi, Yanagida ; Hisano, Nomura Kitano, Koike, Komine, Okada

IMPLICATIONS OF A LARGE $(\delta^d_{23})_{RR}$ (with a possibly large CP$\neq$ phase)

CHANG, A.M., MURAYAMA

- $\sin 2\beta$: $A_{CP}(B_d \to J/\psi\, K_s)$ unaffected, but new contributions to $\mathrm{Im}\, A(B_d \to \phi K_s)$

$\Rightarrow$ DISCREPANCY BETWEEN $\sin 2\beta$ INFERRED from $J/\psi\, K_s$ and ϕK_s CHANNELS

- $B_s \to J/\psi\, \Phi$ SM: negligible $A_{CP}(B_s \to J/\psi\, \phi)$

  $\hookrightarrow$ no phase in $B_s - \bar{B}_s$

  no phase in 

SUSY: possible large $A_{CP}(B_s \to J/\psi\, \phi)$ because of phase in $B_s - \bar{B}_s$

- $B_s \to D_s^+ K^-$ SM: γ 

  SUSY: different "γ" because of new CP$\neq$ contribution to $B_s - \bar{B}_s$

$B^\pm \to D^0 K^\pm$ SM-SUSY same CP$\neq$ contrib.

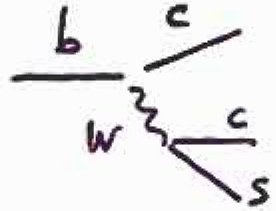
$\Rightarrow$ same "γ"

SIGNALS FOR SUSY in $\sin 2\beta$

$a_{J/\psi K_S}$

CP≠ in mixing ⇒ phase ϕ_M

interference of [box] with tree level



but in $b \to s s \bar{s}$ interf. of [box] with

if $\tilde{b}$ - - - × - - - $\tilde{s}$ ↳ COMPLEX given that $\frac{A_{SUSY}}{A_{SM}} \simeq 0.4 \div 0.7$

⇒ possible to have "$\sin 2\beta$" very different from the $\sin 2\beta$ measured in $B \to J/\psi K_S$

COMPARING "$\sin 2\beta$" from

$B_d \to J/\psi K_S$, $B_d \to D^0 \pi^0$ as in SM

$B_d \to \phi K_S$, $B_d \to \pi^0 K_S$ can be ≠ from SM if $\tilde{b}$ - × - $\tilde{s}$ large

Ciuchini, Franco, Martinelli, A.M., Silvestrini ; Grossman, Worah ; Barbieri, Strumia

3. NO FLAVOR BLINDNESS OF THE SUSY BREAKING MECHANISM

(perhaps most common situation in SUGRA where moduli can take part in SUSY ≠ mechanism)

$\Longrightarrow$ strong constraints from FCNC (even more if CP is violated in the FCNC)

Gabbiani, Gabrielli, A.M., Silvestrini

but still room for sizeable deviations from SM expectations

$\varepsilon'/\varepsilon \quad\quad\quad \varepsilon$

$$\mathrm{Im}\,(\delta^d_{12})_{LR} \sim 10^{-5} \qquad\qquad \mathrm{Im}\,(\delta^d_{12})_{LL} \sim 3\cdot 10^{-3}$$

easy to obtain with SUSY phases of $O(10^{-1})$

in MSSM with flavor universality:

$$- - \tilde{s}_R - - \times - - \tilde{s}_L - - \times - - \tilde{d}_L \quad \longrightarrow \quad \text{completely negligible}$$

$$A m_s \tilde{m} \qquad\qquad (K (m_u^{diag})^2 K^+)_{12}$$

Gabrielli, Giudice

→ SUSY CONTRIBUTION TO ε'/ε IS VERY TINY

(→ MSSM WITH FLAVOR UNIV. $\cancel{CP}$ OF SUPERWEAK KIND)

THIS STATEMENT DOES **NOT** APPLY TO "REASONABLE" SUSY MODELS WITH NEW FLAVOR STRUCTURE

Ex: $W \supset Y_D^{ij}(T)\, Q^i D^j H_D$ (T moduli fields)

↳ Yukawa couplings: $Y_D^{ij}(\langle T \rangle)$

trilinear scalar couplings: $\tilde{d}_L \tilde{d}_R^* H$: $\langle F_T \rangle$

↳ SUSY BREAKING

$$\mathcal{L}_{trilinear} \supset \frac{\partial Y_D^{ij}}{\partial T} \langle F_T \rangle\, \tilde{Q}^i \tilde{D}^j H_D$$

A. M., MURAYAMA

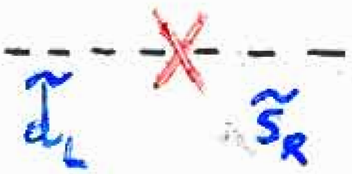
$$M_d \propto \begin{pmatrix} m_d & m_s \sin\theta_c \\ & m_s \end{pmatrix}$$

$(\delta_{12})_{LR}$

$$M^2_{\tilde{d}_L \tilde{d}_R} \propto \begin{pmatrix} a\, m_d & b\, m_s \sin\theta_c \\ & c\, m_s \end{pmatrix}$$

a, b, c constants of $O(1)$ $\Longrightarrow$ unless $a = b = c$ exactly, M_d and $M^2_{\tilde{d}_L \tilde{d}_R}$ are

NOT SIMULTANEOUSLY DIAGONALIZABLE



$$\left(\delta^d_{12}\right)_{LR} \simeq \frac{\tilde{m}\, m_s \sin\theta_c}{m^2_{\tilde{q}}} = \qquad \langle F_T \rangle$$

$$= 2\times 10^{-5} \left(\frac{m_s(M_{Pl})}{50\,\mathrm{MeV}}\right) \left(\frac{\tilde{m}}{m_{\tilde{q}}}\right) \left(\frac{500\,\mathrm{GeV}}{m_{\tilde{q}}}\right)$$

A.M., Murayama; Babu, Dutta, Mohapatra
Khalil, Kobayashi, Vives

possibility of achieving it through double mass insertion

Baek, Ko

$b \to s$ TRANSITIONS

Available exp. info :

$BR(B \to X_s \gamma) = (3.29 \pm 0.34) \times 10^{-4}$

$A_{CP}(B \to X_s \gamma) = -0.02 \pm 0.04$

$BR(B \to X_s e^+ e^-) = (6.1 \pm 1.4 \pm 1.3) \times 10^{-6}$

$\Delta M_{B_s} > 14.4\ ps^{-1}$

STILL POSSIBLE TO HAVE "SUSY SURPRISES" IN SPITE OF THE ABOVE CONSTRAINTS

ex: $\cancel{CP}$ in $b \to s$ transitions

"$\sin 2\beta$" from $B_d \to \phi K_S$ and $B_d \to J/\psi K_S$

$\sin 2\beta$ from $B_d \to J/\psi K_S$ 0.734 ± 0.054

$S_{\phi K}$ from $B_d \to \phi K_S$

BELLE	BABAR
-0.99 ± 0.50	$+0.45 \pm 0.43$

in SM $\sin 2\beta = S_{\phi K}$!

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CIUCHINI, FRANCO, A.M., SILVESTRINI

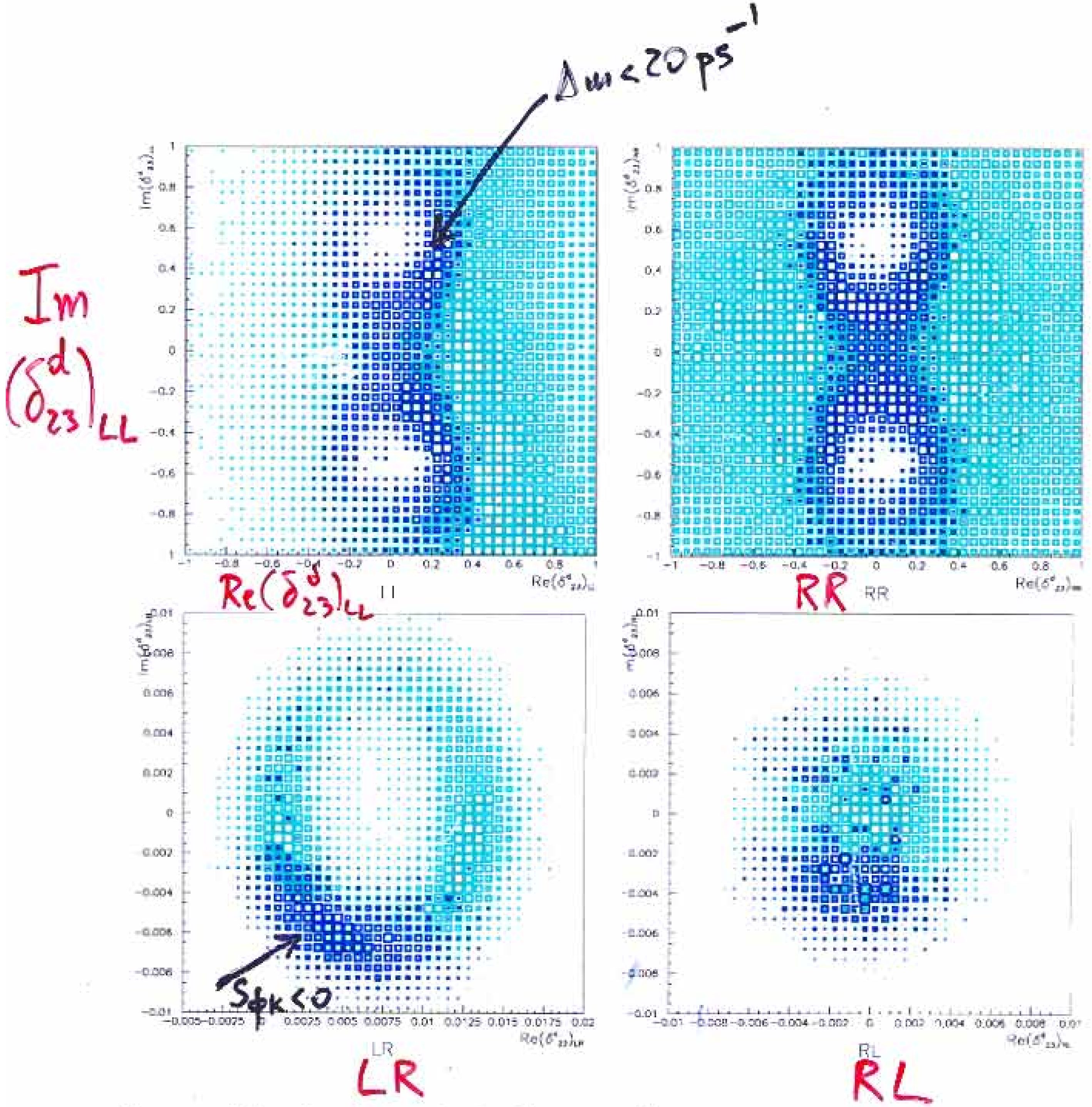


Figure 1: Allowed regions in the $\mathrm{Re}(\delta^d_{23})_{AB}$–$\mathrm{Im}(\delta^d_{23})_{AB}$ space for $m_{\tilde{q}} = m_{\tilde{g}} = 350$ GeV and $AB = (LL, RR, LR, RL)$. Constraints from $BR(B \to X_s\gamma)$, $A_{CP}(B \to X_s\gamma)$, $BR(B \to X_s l^+l^-)$ and the lower bound on ΔM_s have been used. The darker regions are selected imposing the further constraint $\Delta m_s < 20$ ps^{-1} for LL and RR insertions and $S_{\phi K} < 0$ for LR and RL insertions.

$S_{\phi K} - A_{CP}\,(b \to s\gamma)$

CFMS

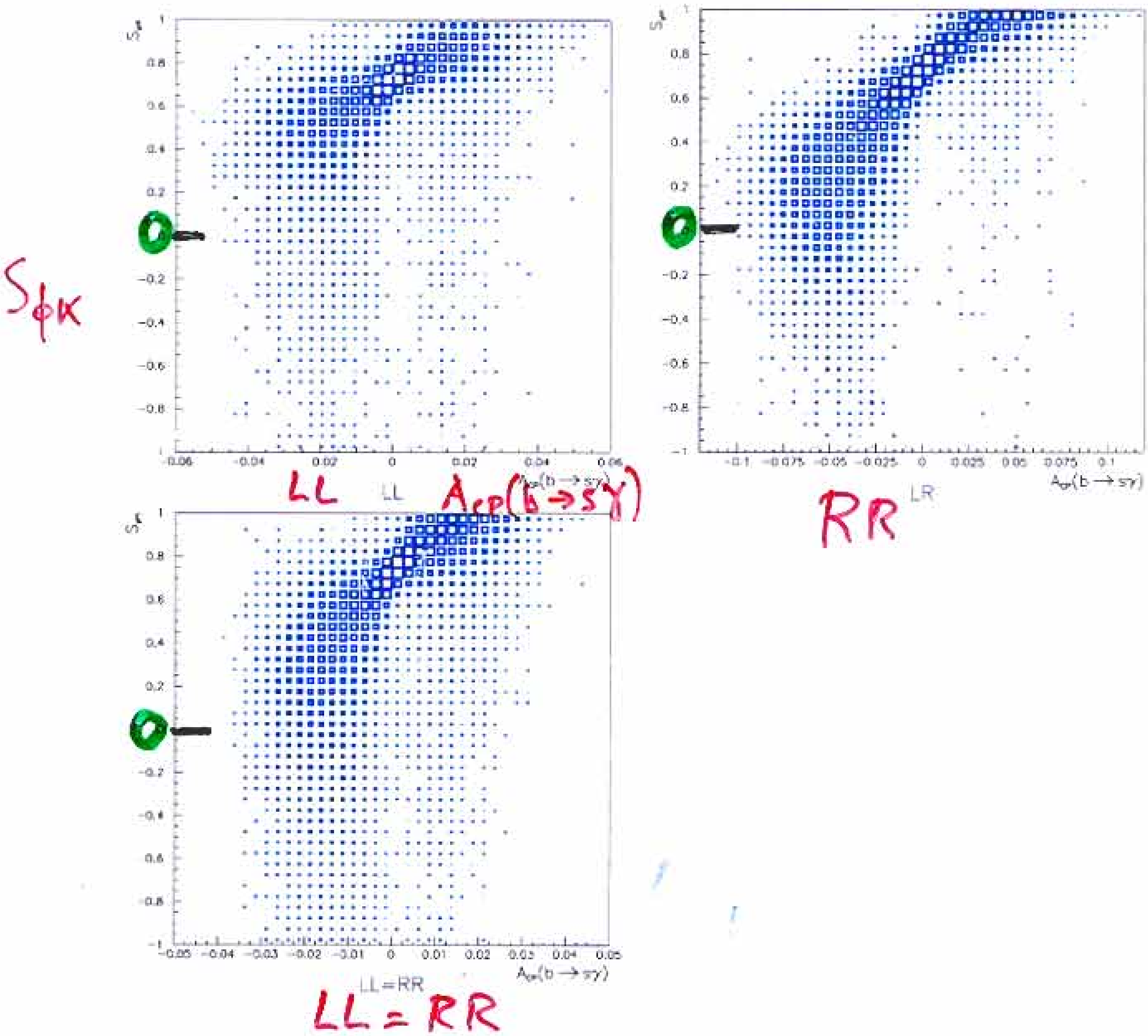
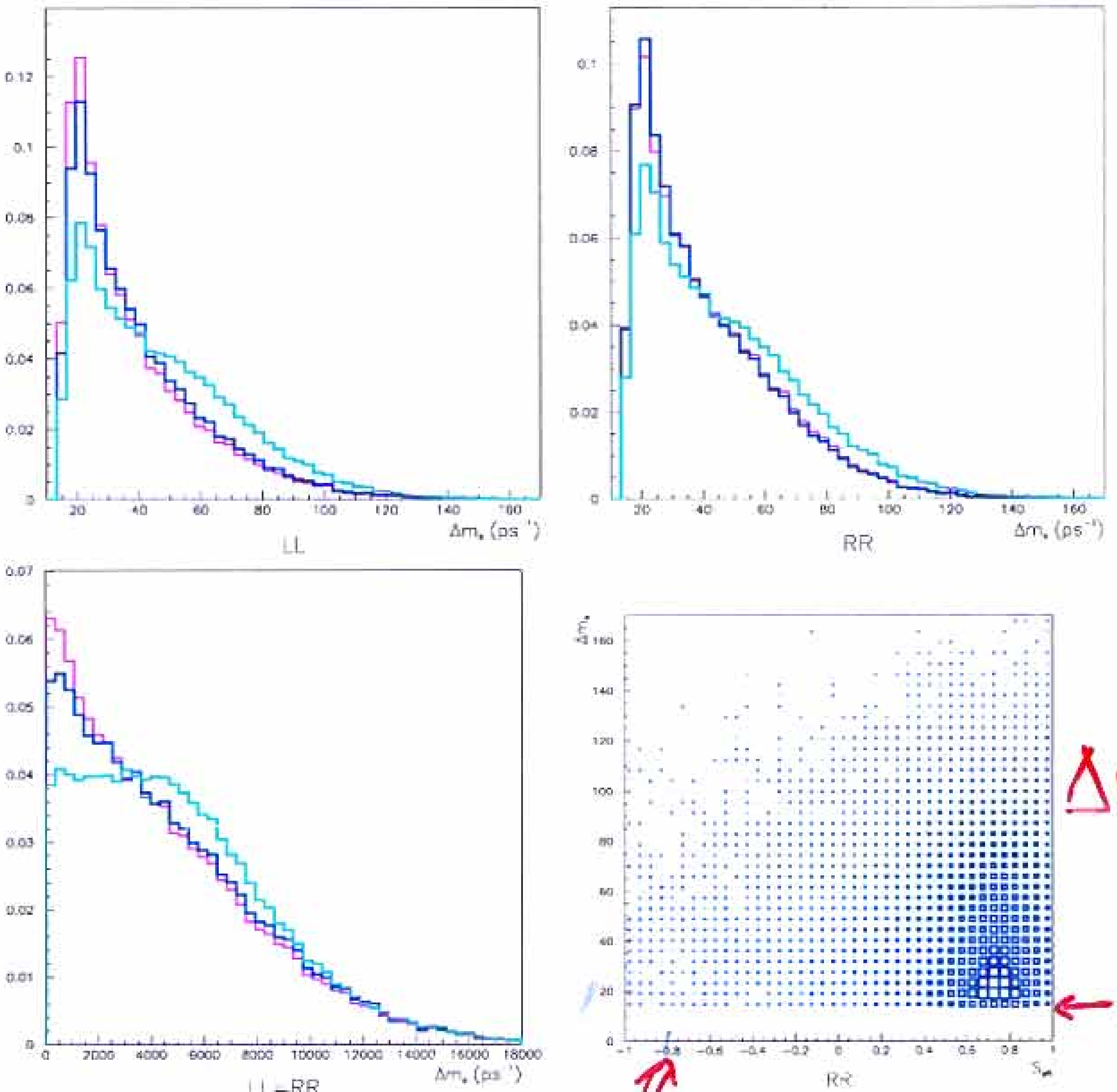


Figure 7: Correlation between $S_{\phi K}$ and $A_{CP}(b \to s\gamma)$ for various SUSY mass insertions $(\delta^d_{23})_{AB}$ with $AB = (LL, LR, LLRR)$. Constraints from $BR(B \to X_s\gamma)$, $A_{CP}(B \to X_s\gamma)$, $BR(B \to X_s l^+ l^-)$ and the lower bound on ΔM_s have been used.

DISTRIBUTIONS OF Δm_s for $(\delta^d_{23})_{LL,RR,LL=RR}$ mass insertions

CFMS



Δm_s

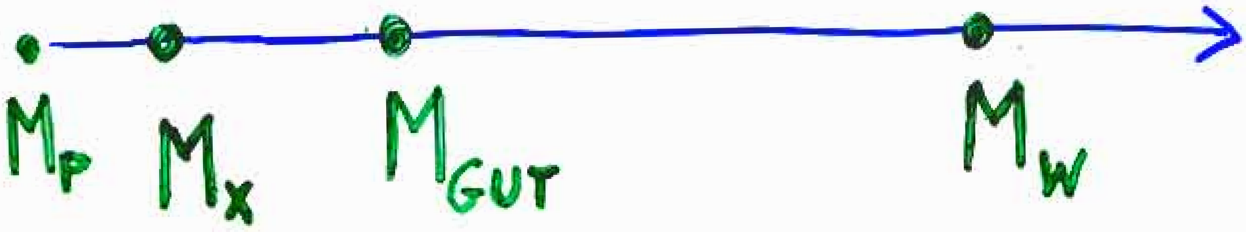
$\leftarrow 20$ ps^{-1}

$\Uparrow$ RR

Figure 8: Distributions of ΔM_s for various SUSY mass insertions $(\delta^d_{23})_{AB}$ with $AB = (LL, RR, LLRR)$. Different curves correspond to the inclusion of constraints from $B \to X_s\gamma$ only (magenta), $B \to X_s l^+ l^-$ only (cyan) and all together (blue). Lower right: correlation between ΔM_s and $S_{\phi K}$ in the RR case.

LEPTONIC / HADRONIC — FCNC RELATED IF

CIUCHINI, A.M., SILVESTRINI, VEMPATI, VIVES



M_X ↓ scale where soft breaking terms appear

at M_{GUT} ⇓ SU(5)

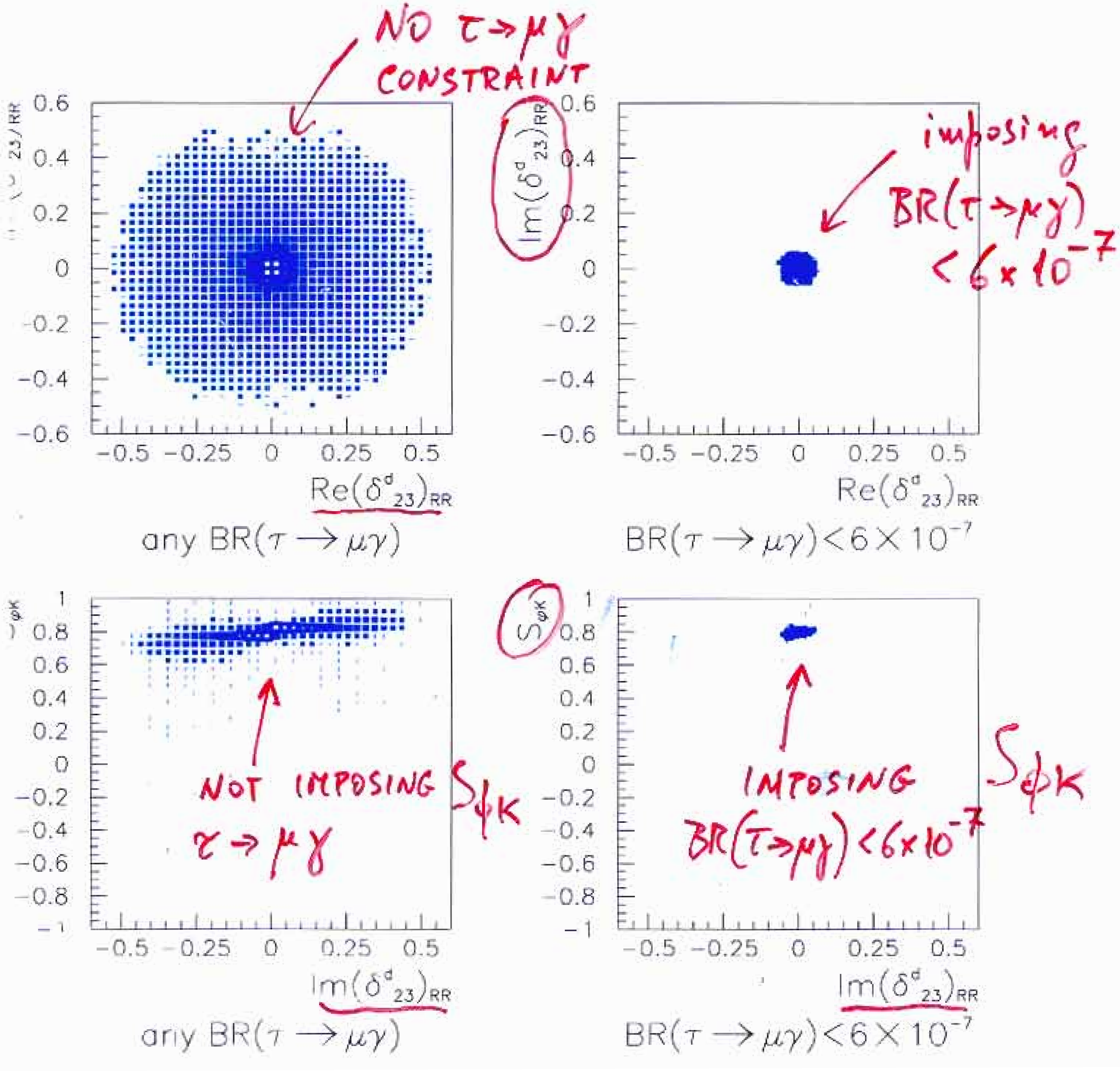
$$\begin{cases} (\Delta^u_{ij})_{LL} = (\Delta^u_{ij})_{RR} = (\Delta^d_{ij})_{LL} = (\Delta^\ell_{ij})_{RR} \\ (\Delta^d_{ij})_{RR} = (\Delta^\ell_{ij})_{LL} \\ (\Delta^d_{ij})_{LR} = (\Delta^\ell_{ji})_{LR} = (\Delta^\ell_{ij})^*_{RL} \end{cases}$$

if no new part. couple $M_G \to M_W$

⇓ RG EVOLUTION FROM M_{GUT} TO M_W

$$\begin{cases} (\delta^u_{ij})_{RR} \simeq \dfrac{m^2_{\tilde{e}^c}}{m^2_{\tilde{u}^c}} (\delta^\ell_{ij})_{RR} \\ (\delta^q_{ij})_{LL} \simeq \dfrac{m^2_{\tilde{e}^c}}{m^2_{\tilde{Q}}} (\delta^\ell_{ij})_{RR} \\ (\delta^d_{ij})_{RR} \simeq m^2_{\tilde{L}}/m^2_{\tilde{d}^c} (\delta^\ell_{ij})_{LL} \\ (\delta^d_{ij})_{LR} \simeq \dfrac{m_b}{m_\tau} (\delta^\ell_{ij})^*_{LR} \dfrac{\sqrt{m^2_{\tilde{L}} \cdot m^2_{\tilde{e}^c}}}{\sqrt{m^2_{\tilde{Q}}\, m^2_{\tilde{d}^c}}} \end{cases}$$

CONSTRAINTS ON $Re(\delta^d_{23})_{RR}$ – $Im(\delta^d_{23})_{RR}$ AND $S_{\phi K}$ – $Im(\delta^d_{23})_{RR}$ from $\tau \to \mu + \gamma$



CONCLUSIONS

- IF: STRICT SUSY FLAVOR BLINDNESS AT ELW SCALE

  ⇒ EDMs

- IF: FLAVOR UNIVERSALITY AT LARGE SCALE, BUT RUNNING SPOILS EXACT FLAVOR BLINDNESS (ex. SUSY SEESAW)

  ⇒ EDMs, CP̸ in B PHYSICS + LFV

- IF: SUSY BREAKING MECHANISM "KNOWS" FLAVOUR

  ⇒ EDMs, CP̸ in K and B PHYSICS + LFV