

Phases dans le secteur des gauginos

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- 1 Introduction
- 2 Evolution des masses
- 3 Sections efficaces
- 4 Exclusion avec les phases

- Charginos

$$\mathcal{M}_{\tilde{\chi}^-} = \begin{bmatrix} M_2 & \sqrt{2}M_W \sin \beta \\ \sqrt{2}M_W \cos \beta & \mu e^{i\phi_\mu} \end{bmatrix}$$

- Neutralinos

$$\mathcal{M}_{\tilde{\chi}^0} = \begin{bmatrix} M_1 e^{i\phi_{M_1}} & 0 & -M_Z \sin \theta_W \cos \beta & M_Z \sin \theta_W \sin \beta \\ 0 & M_2 & M_Z \cos \theta_W \cos \beta & -M_Z \cos \theta_W \sin \beta \\ -M_Z \sin \theta_W \cos \beta & M_Z \cos \theta_W \cos \beta & 0 & -\mu e^{i\phi_\mu} \\ M_Z \sin \theta_W \sin \beta & -M_Z \cos \theta_W \sin \beta & -\mu e^{i\phi_\mu} & 0 \end{bmatrix}$$

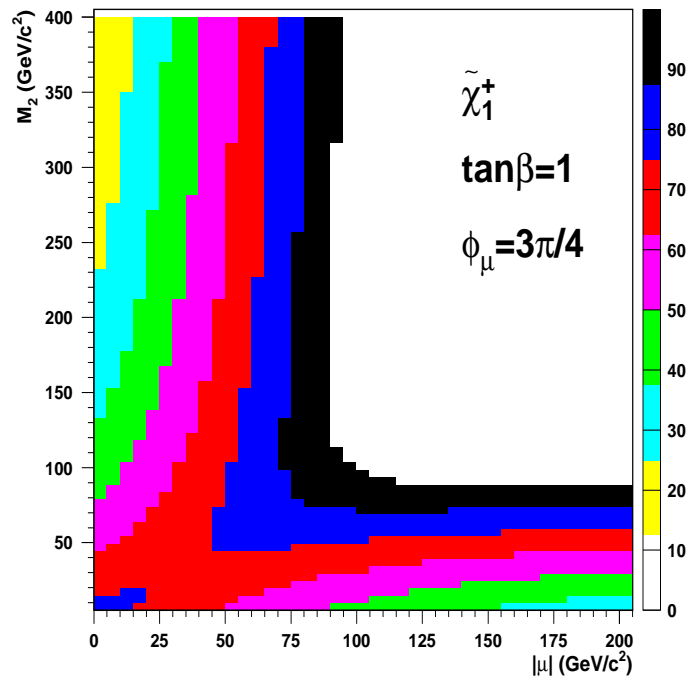
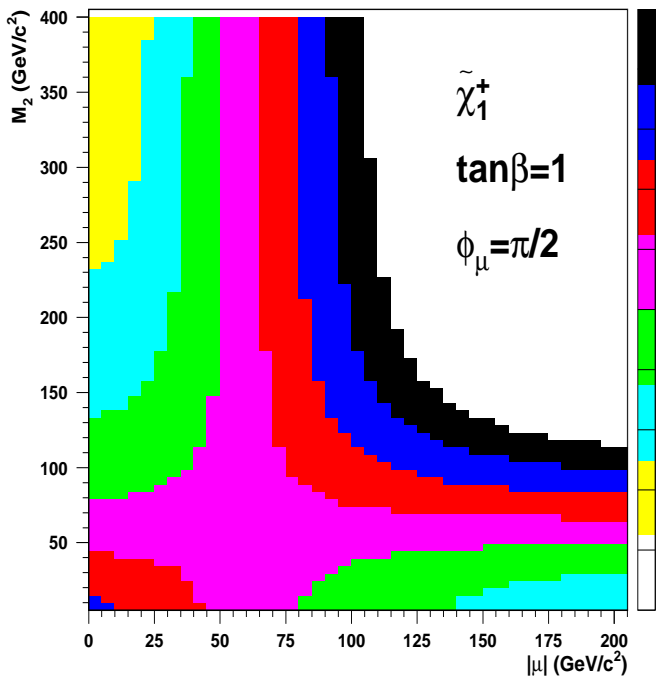
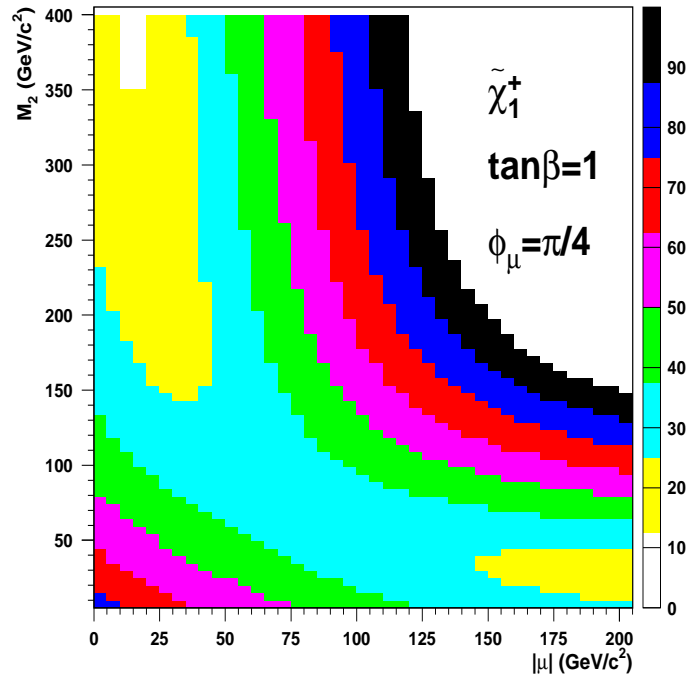
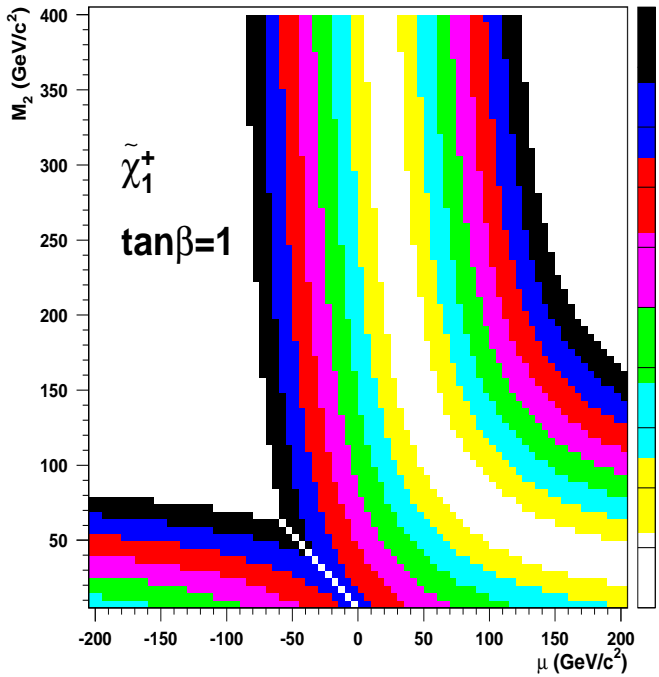
DEUX phases : ϕ_{M_1} et ϕ_μ

→ Masses varient avec les phases

→ Sections efficaces changent

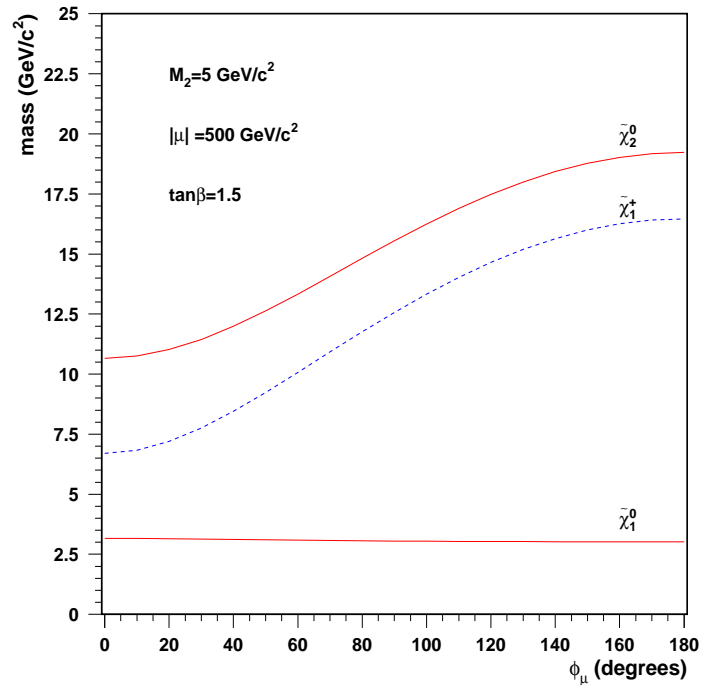
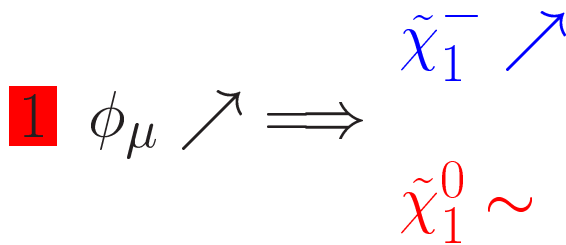
Remise en cause des limites ?

Isomasses dans le plan (M_2, μ) :



Evolution en termes de ϕ_μ :

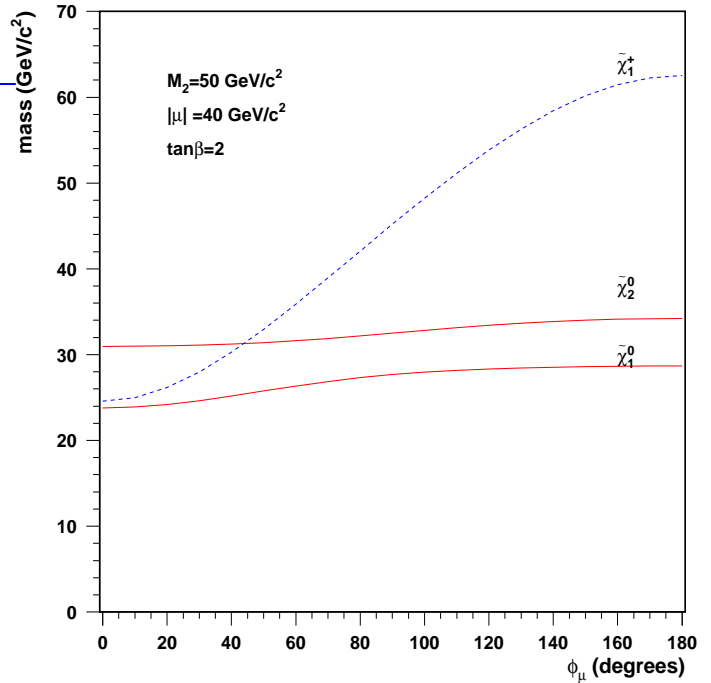
- Masse du chargino augmente avec ϕ_μ
- Classification en **6 classes**



2

$$\phi_\mu \sim 0 \implies \tilde{\chi}_1^0 \sim \tilde{\chi}_1^-$$

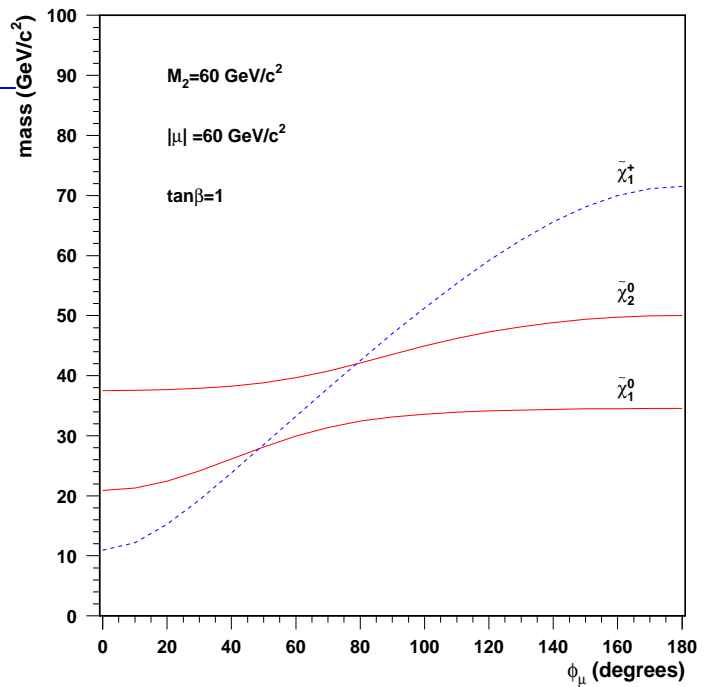
$$\phi_\mu \nearrow \implies \tilde{\chi}_1^- \nearrow$$



3

$$\phi_\mu \sim 0 \implies \tilde{\chi}_1^0 \geq \tilde{\chi}_1^-$$

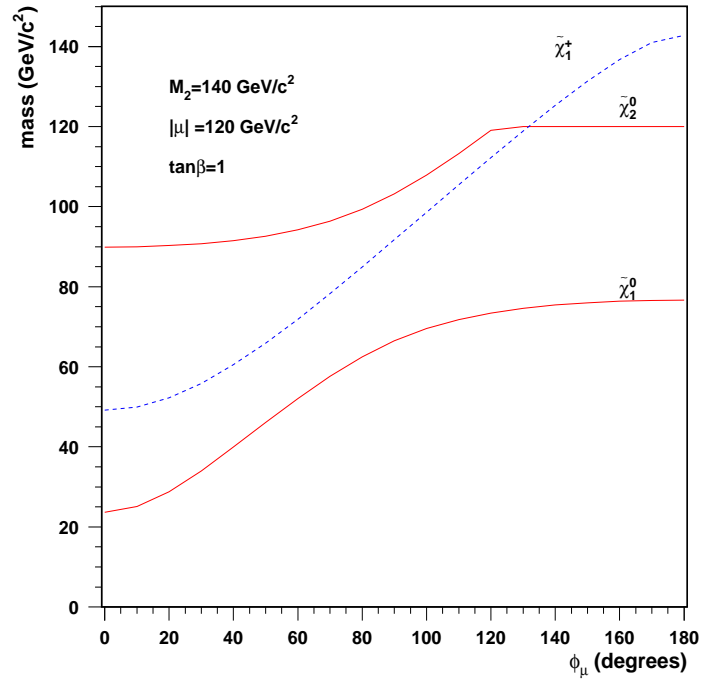
$$\phi_\mu \nearrow \implies \tilde{\chi}_1^- \nearrow$$



4

$\tilde{\chi}_1^0$ \nearrow

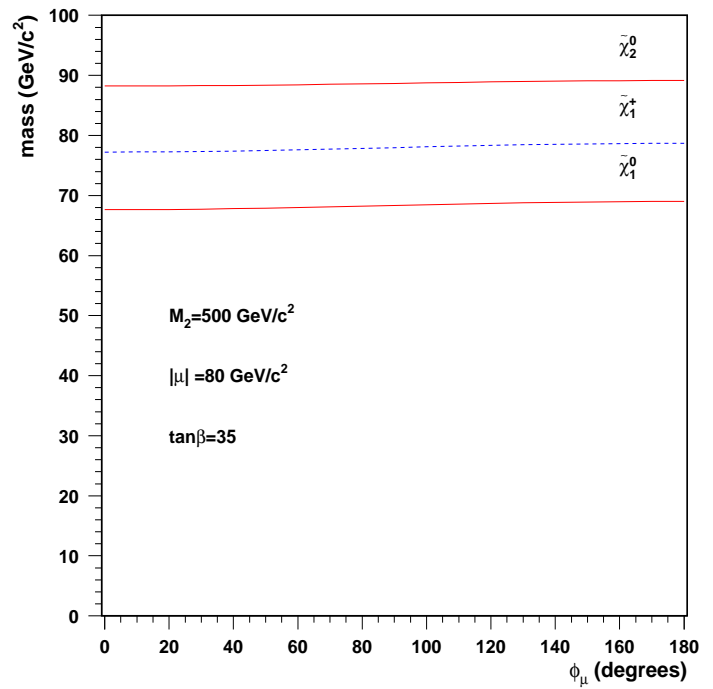
$\tilde{\chi}_1^-$ \nearrow



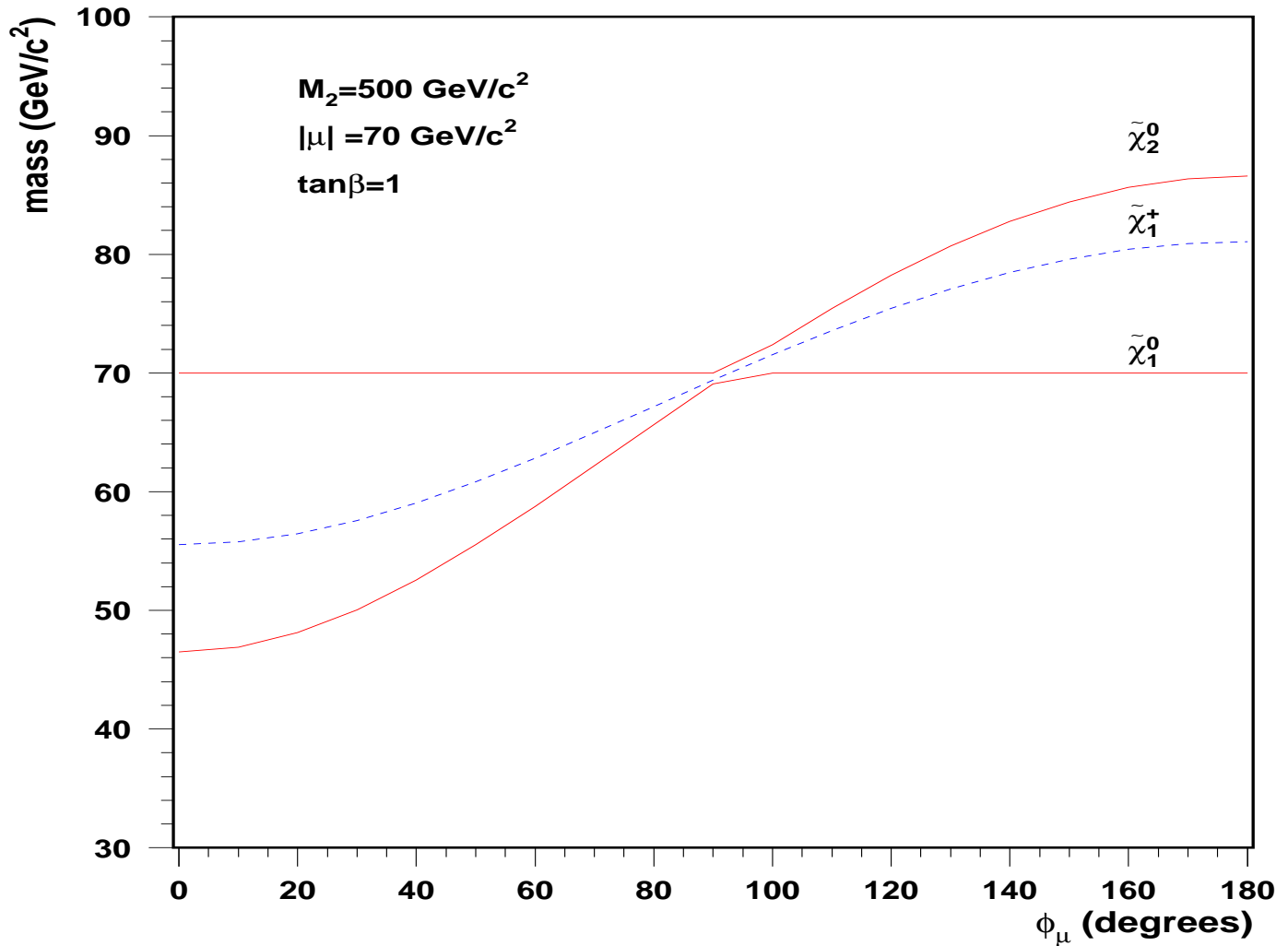
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$\tilde{\chi}_1^0 \sim$

$\tilde{\chi}_1^- \sim$



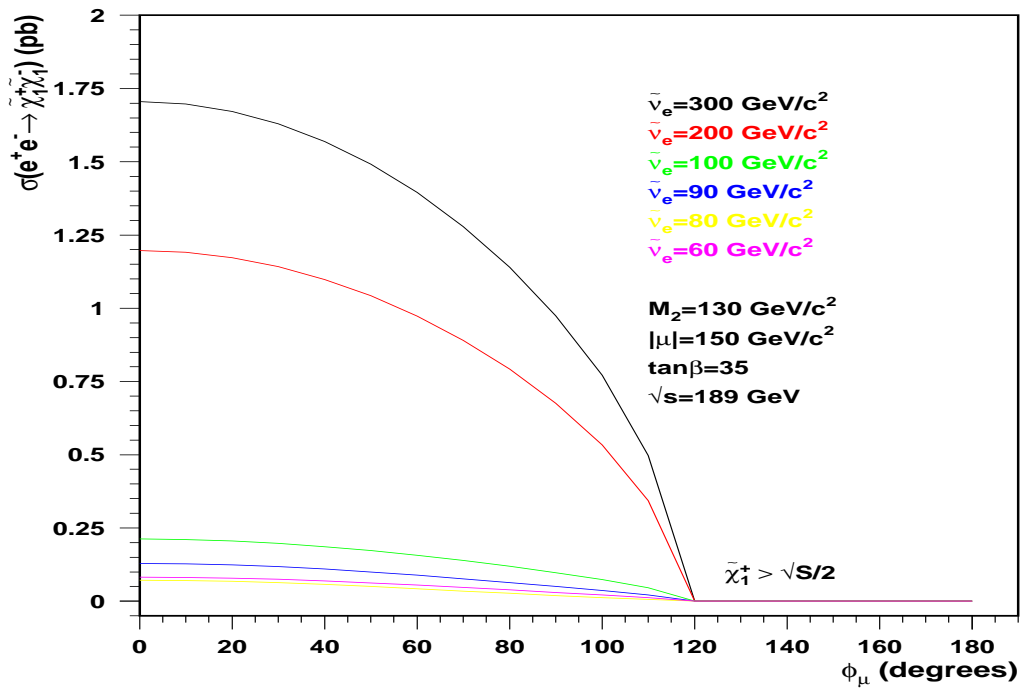
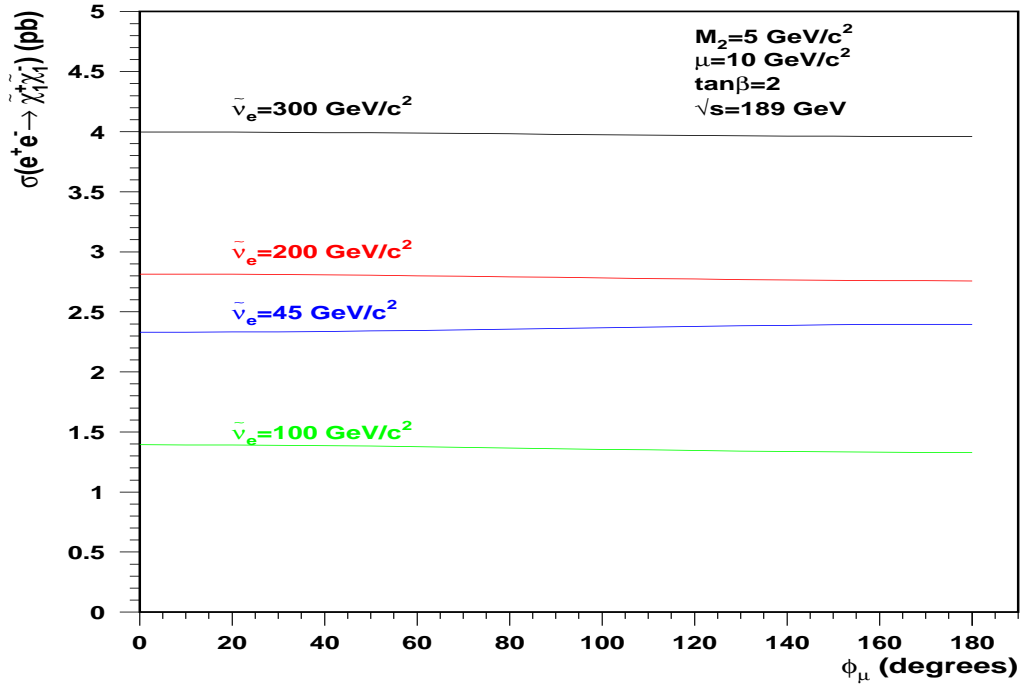
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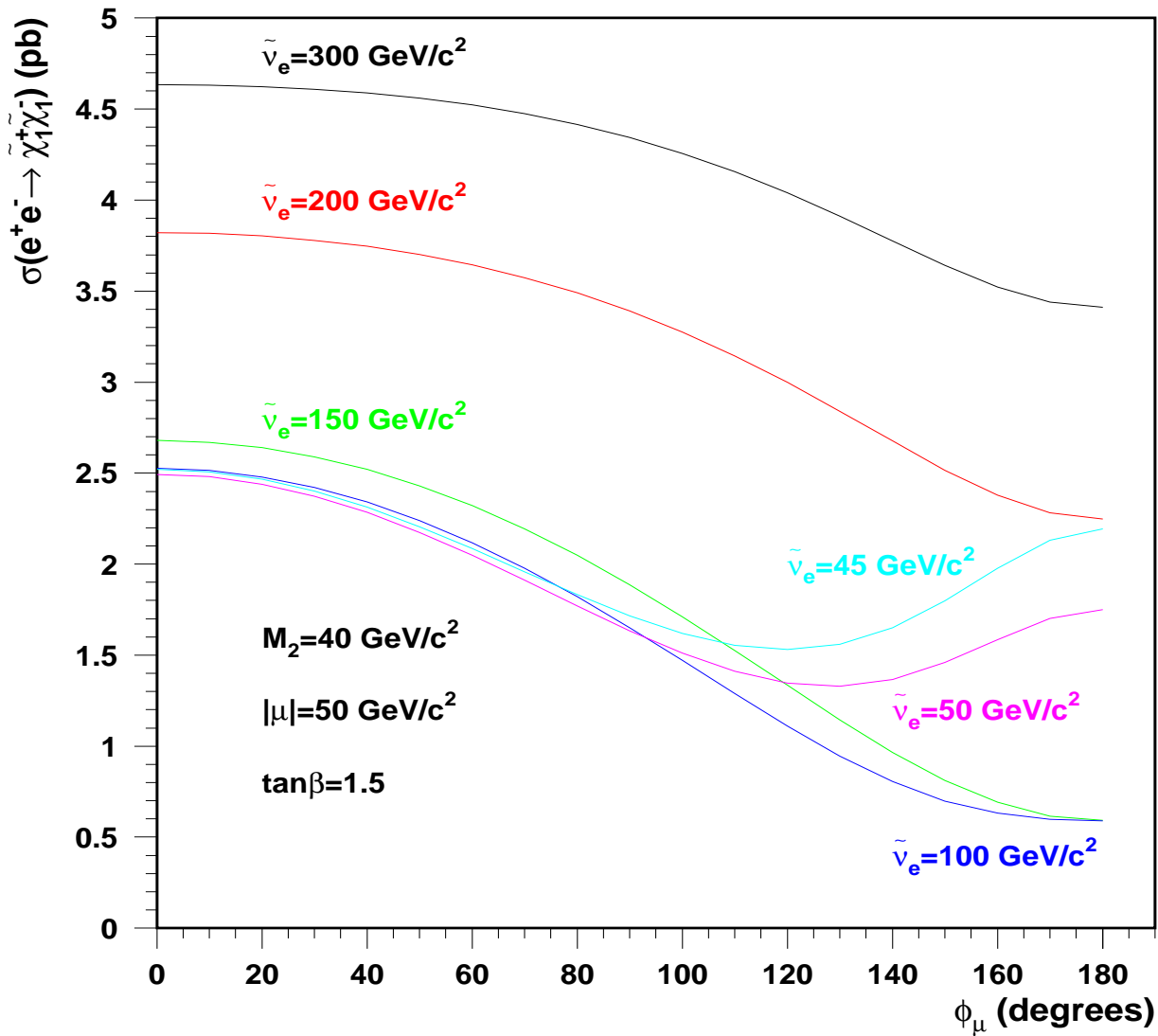


- $\phi_\mu = \frac{\pi}{2} \longrightarrow \underline{\text{Degenerescence}}$

$$M_{\tilde{\chi}_1^+}^2 - M_{\tilde{\chi}_1^0}^2 \sim \Re(\mu M_1)$$

- Dépendance en ϕ_μ

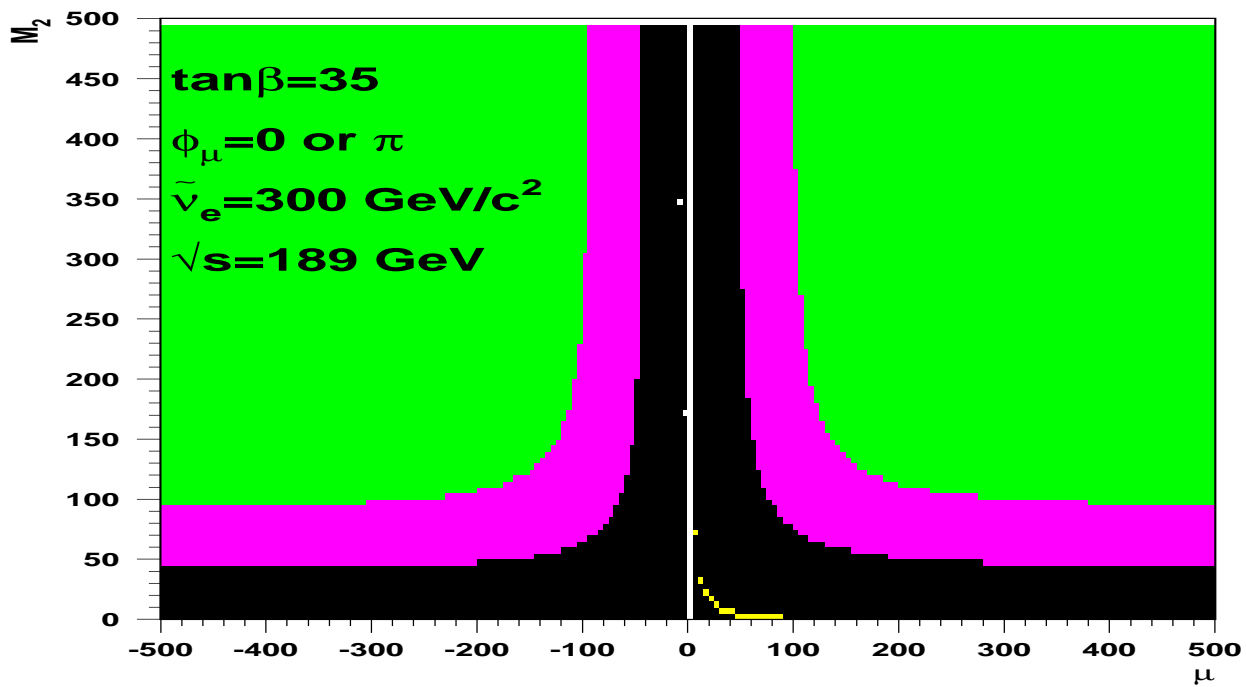
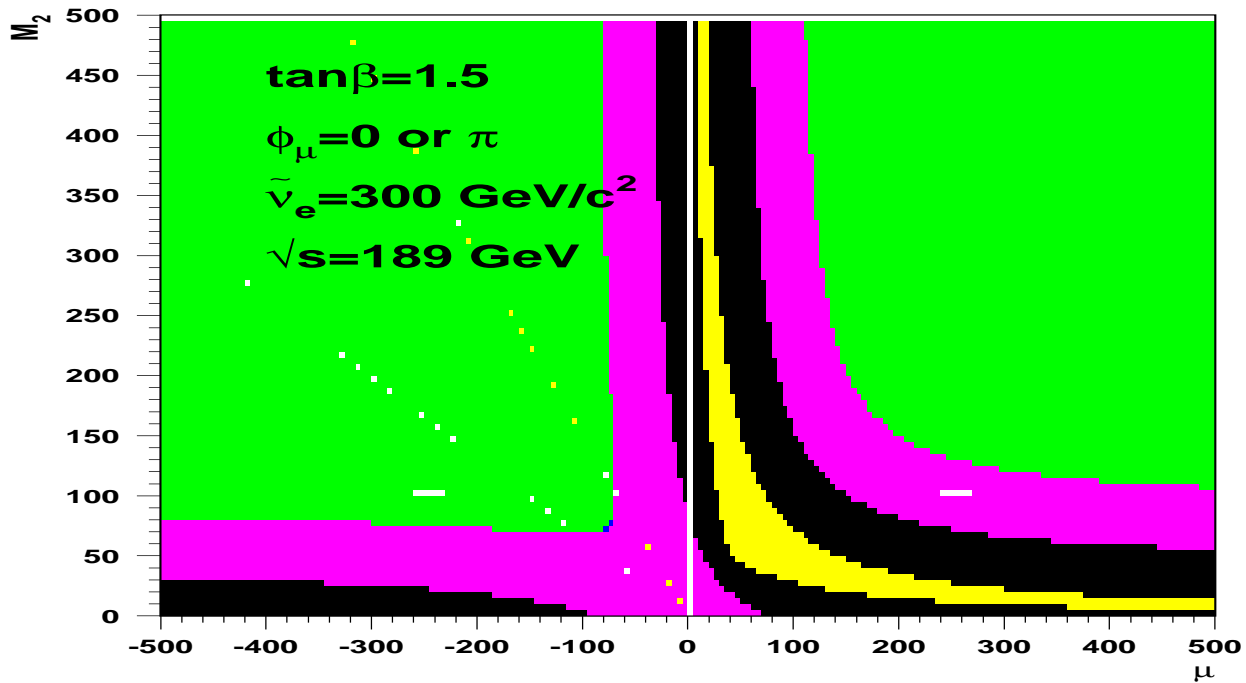


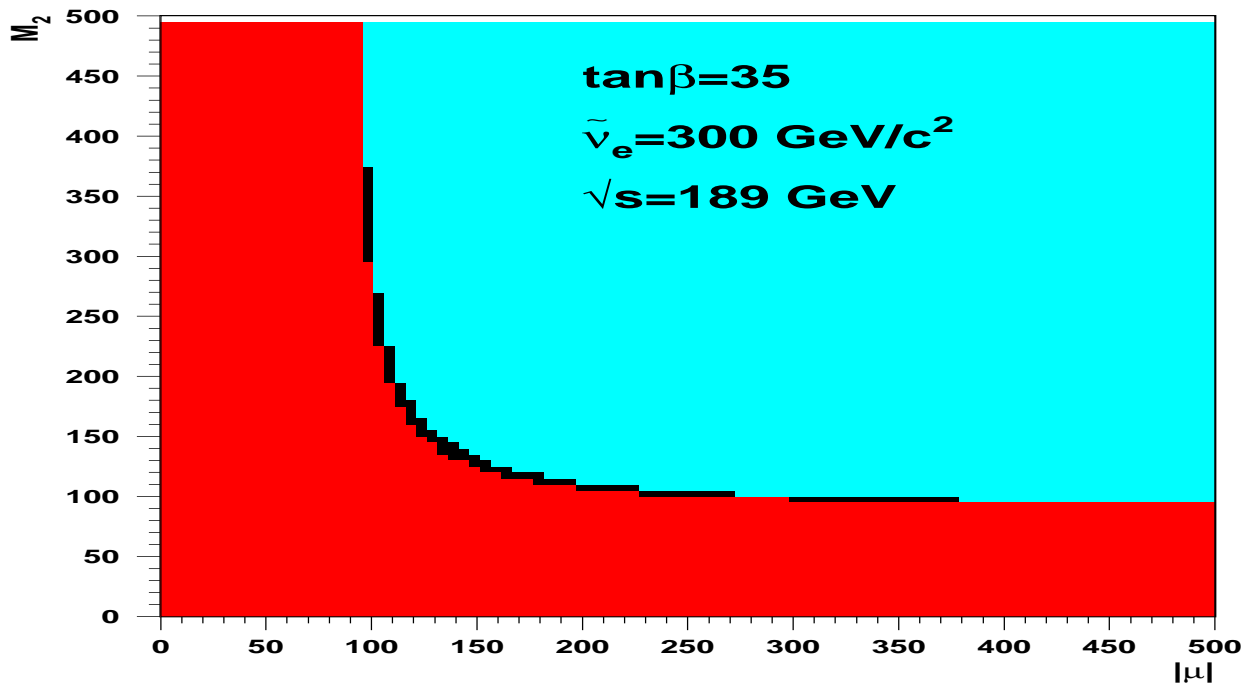
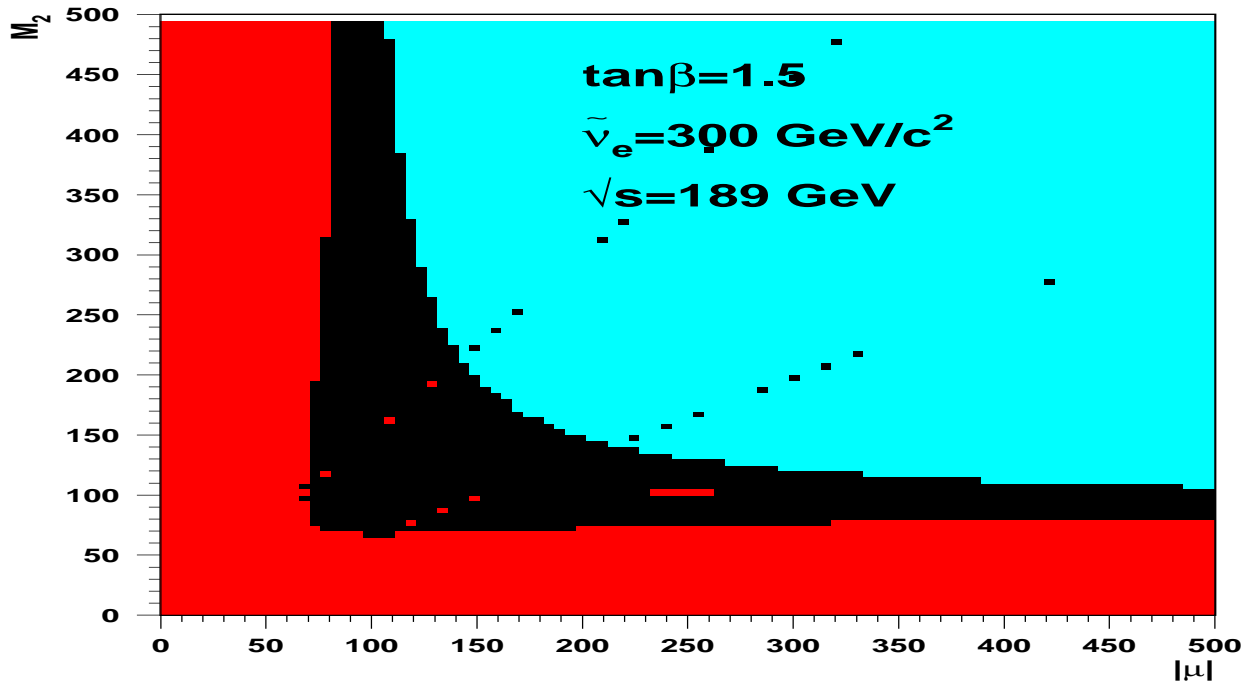


$$\sigma_{min}(\tilde{\chi}_1^+ \tilde{\chi}_1^-) \text{ pour } \phi_\mu \neq 0, \pi$$

Remise en cause des limites expérimentales ?

Deux modèles: $\tan\beta = 1.5$ et $\tan\beta = 35$





- 1 $M_{\tilde{\chi}_1^-}$ augmente avec ϕ_μ
 - 2 $\sigma(\tilde{\chi}_1^+ \tilde{\chi}_1^-)$ diminue avec ϕ_μ
 - 3 $\phi_{min} \neq \pi$ ($\tilde{\nu}_e$ légers)
 - 4 Pas d'exclusion par les phases
 - 5 **mais**
 - ISR et FSR (?)
 - Rapports de branchement à prendre en compte
 - Scénari avec $\tilde{\nu}_e$ plus léger
(scan en m_0 ?)
 - 6 Nouveaux plots d'exclusion ($|\mu|, M_2$)
- Travail en cours