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The Effect of Fourth Generation Standard Model on the CP Asymmetry in $B_s \rightarrow \phi \ell^+ \ell^-$ Decay

We investigate the influence of the fourth generation of quarks on the CP-asymmetry in $B_s \rightarrow \phi \ell^+ \ell^-$ Decay. This new quarks changes the values of the Wilson coefficients $C_7(\mu)$, $C_9(\mu)$ and $C_{10}(\mu)$ via virtual exchange of the fourth generation up type quark t' .

Taking the $|V_{tb}V_{t's}^*| \sim \{0.01 - 0.03\}$ with phase $\{60, 90, 120\}$

, which is consistent with the $b \rightarrow s \ell^+ \ell^-$ rate and the B_s mixing parameter $\Delta_{m_{B_s}}$, We obtain that for both (μ, τ) channels the CP-asymmetries are quite sensitive to the 4th generation quarks mass and mixing parameters. Hence, studying CP-asymmetry for B_s

$\text{rar} \phi \ell^+ \ell^-$ decay with new Wilson coefficients can serve as an effective way to identify the new generation quarks (t', b') in high energy physics laboratories.

Experimental Collaboration

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