**INTRODUCTION**

Phenomena beyond the standard model (SM) of particle physics can become manifest directly, via the production of new particles, or indirectly, by affecting the production and decay of SM particles. The flavor changing neutral current (FCNC) processes in B meson semi-leptonic decays are particularly sensitive to possible new physics (NP) phenomena. The physics process such as $B \to X_s \tau^+\tau^-$ transition, which proceeds at lowest order in SM via either a Z/γ-penguin diagram or a $W^+W^-$ box diagram as shown, are highly suppressed in the SM and sensitive to NP. NP may modify any of the angular variables relative to their SM values.

The CMS experiment has studied some of these quantities through $B^0 \to K^{*0}\mu^+\mu^-$ with $\tau$-Tagging data taken during 2011[1] and 8TeV data taken during 2012[2], the measurements are consistent with the SM. The LHCB and Belle Collaborations respectively reported a discrepancy larger than 3 standard deviations ($\sigma$) with respect to the SM for the so-called $P_c$ variable [3–5]. We will also present a precise measurement of the $P_c$ variable, together with the $P_l$ variable, using a sample of $B^0 \to K^{*0}\mu^+\mu^-$ events collected during 2012.

**SYSTEMATIC UNCERTAINTY**

The total uncertainty in each $q^2$ bin is obtained by adding each contribution in quadrature. For each item, the range indicates the variation of the uncertainty in the signal $q^2$ bin.

**CONCLUSION AND OUTLOOK**

Using $\psi$ pp collision data recorded at $\sqrt{s} = 8$ TeV with the CMS detector at the LHC, corresponding to an integrated luminosity of 20.5 fb$^{-1}$, an angular analysis has been carried out on the decay $B^0 \to K^{*0}\mu^+\mu^-$. The data used for this analysis include 1397 signal decays. For each bin of the dimuon invariant mass squared ($q^2$), un-binned maximum likelihood fits were performed for the $K^{*0}\mu^+\mu^-$ invariant mass and two decay angles, to obtain values of $A_{FB}$, $F_1$, $dB/dq^2$, $P_c$ and $P_l$ parameters. The results are among the most precise to date and are consistent with standard model predictions and the other experiments’ results, with a comparable or higher precision[2]. Under a higher luminosity and better trigger requirements, the data collected during 2016 by CMS detector will be more efficiently used for full angular analysis studies. Several rare decays, $B^0 \to K^{*0}\mu^+\mu^-$, $B^0 \to K^{*0}\mu^+\mu^-$, $B \to \phi \mu^+\mu^-$ will be carefully investigated.