

## Abstract

Although the Lepton Flavor Violating (LFV) decay  $\mu^+ \rightarrow e^+\gamma$  is forbidden in the Standard Model (SM), it can take place within various theories beyond the SM. If the branching ratio of this decay saturates its present bound [*i.e.*,  $\text{Br}(\mu^+ \rightarrow e^+\gamma) \sim 10^{-11}$ ], the forthcoming experiments can measure the branching ratio with high precision and consequently yield information on the sources of LFV. In this seminar, we show that for polarized  $\mu^+$ , by studying the angular distribution of the transversely polarized positron and linearly polarized photon we can derive information on the CP-violating sources beyond those in the SM. We also study the angular distribution of the final particles in the decay  $\mu^+ \rightarrow e_1^+ e^- e_2^+$  where  $e_1^+$  is defined to be the more energetic positron. We show that transversely polarized  $e_1^+$  can provide information on a certain combination of the CP-violating phases of the underlying theory which would be lost by averaging over the spin of  $e_1^+$ .