List of Tables

1.1 1.2	SM fermions along with their quantum numbers in SM gauge group	4 4
3.1	Measurements of R_{K^*} for both the B^0 and B^+ modes in multiple q^2 bins by Belle collaboration [50]. The first (second) experimental errors are statistical (systematic).	37
3.2	All measurements and the world averages of R_D - R_{D^*} along with their SM predictions. The first (second) experimental errors are statistical (systematic).	39
4.1	Calculation of the branching ratios of $B_s^* \to \mu^+ \mu^-$ for various new physics scenarios. Here $\Delta \chi^2 = \chi^2_{SM} - \chi^2_{bf}$ and χ^2_{bf} is the χ^2 at the best fit points. We provide 1σ range of the new physics couplings for the one parameter fits and the central values for multiple parameter fits.	46
5.1	Numerical inputs used in our calculations.	52
5.2	New physics predictions of branching ratio and $\mathcal{A}_{LP}(\mu)$ for $B_s^* \to \mu^+ \mu^-$ decay with real new physics WCs. The new physics WCs are taken from Ref. [78]	52
5.3	New physics predictions of branching ratio and $\mathcal{A}_{LP}(\mu)$ for $B_s^* \to \mu^+ \mu^-$ decay with complex new physics WCs. The new physics WCs are taken from Ref. [68]	52
7.1	The best fit values of new physics WCs in $b \rightarrow se^+e^-$ transition for 1D and 2D scenarios. The value of $\chi^2_{e_{M}}$ is 27.42.	62
7.2	The predictions of R_K , $R_{K^*}^{\text{low}}$ and $R_{K^*}^{\text{central}}$ for the good fit scenarios obtained in Table 7.1. The 1σ experimental ranges are $0.784 < R_K < 0.908$, $0.547 < R_{K^*}^{\text{low}} < 0.773$ and $0.563 < R_{K^*}^{\text{central}} < 0.807$.	62
7.3	Here we list only those new physics WCs which generate R_K and R_{K^*} within 1σ range of their experimental values, <i>i.e.</i> , $0.784 < R_K < 0.908$, $0.547 < R_{K^*}^{\text{low}} < 0.773$ and $0.563 < R_{\text{central}}^{\text{central}} < 0.807$.	63
7.4	Average values of $B \to K^* e^+ e^-$ angular observables A_{FB} , F_L , $S_{3,4,5}$ and $S_{7,8,9}$ in SM as well as for the allowed new physics V/A solutions listed in Table 7.3.	65
7.5	Average values of $P_{1,2,3}$ and $P'_{4,5,6,8}$ in $B \to K^* e^+ e^-$ decay for the three V/A new physics solutions listed in Table 7.3 as well as for the SM.	70
7.6	Here we list only those new physics scenarios which predict R_K and R_{K^*} within 1σ range of experimental values which are $0.784 < R_K < 0.908, 0.547 < R_{K^*}^{low} < 0.773$ and	
	$0.563 < R_{K^*}^{\text{central}} < 0.807.$	72
8.1	Decay constants, bag parameters, QCD corrections and other parameters used in our analy- sis. When not explicitly stated, they are taken from the Particle Data Group [210]	76
8.2	Values of anomalous tcZ couplings	79
A.1	Experimental measurement of the branching ratio of $B^0 \to K^0 \mu^+ \mu^-$	85
A.2	Experimental measurement of the branching ratio of $B^+ \to K^+ \mu^+ \mu^- \ldots \ldots \ldots \ldots$	85
A.3	Experimental measurement of the the angular observable of $B^0 \to K^{*0} \mu^+ \mu^- \dots \dots$	86
A.4	Experimental measurement of the branching ratio of $B^+ \to K^{*+} \mu^+ \mu^-$.	87

A.5	Experimental measurement of the differential branching ratio of $B_s^0 \rightarrow \phi \mu^+ \mu^-$ [43]. The	
	experimental errors are, from left to right, statistical, systematicand due to the uncertainty	
	on the branching ratio of the normalization mode $B_s^0 \rightarrow J/\psi\phi$	87
A.6	Experimental measurement of the angular observables of $B_s^0 \to \phi \mu^+ \mu^-$ [43]. The experi-	
	mental errors are, from left to right, statistical and systematic.	87