

Observable	SM prediction	Theory error	Present result	Future error	Future Facility
$ V_{us} $ $[K \rightarrow \pi \ell \nu]$	input	$0.5\% \rightarrow 0.1\%_{\text{Latt}}$	0.2246 ± 0.0012	0.1%	K factory
$ V_{cb} $ $[B \rightarrow X_c \ell \nu]$	input	1%	$(41.54 \pm 0.73) \times 10^{-3}$	1%	Super- B
$ V_{ub} $ $[B \rightarrow \pi \ell \nu]$	input	$10\% \rightarrow 5\%_{\text{Latt}}$	$(3.38 \pm 0.36) \times 10^{-3}$	4%	Super- B
γ $[B \rightarrow DK]$	input	$< 1^\circ$	$(70^{+27}_{-30})^\circ$	3°	LHCb
$S_{B_d \rightarrow \psi K}$	$\sin(2\beta)$	$\lesssim 0.01$	0.671 ± 0.023	0.01	LHCb
$S_{B_s \rightarrow \psi \phi}$	0.036	$\lesssim 0.01$	$0.81^{+0.12}_{-0.32}$	0.01	LHCb
$S_{B_d \rightarrow \phi K}$	$\sin(2\beta)$	$\lesssim 0.05$	0.44 ± 0.18	0.1	LHCb
$S_{B_s \rightarrow \phi \phi}$	0.036	$\lesssim 0.05$	—	0.05	LHCb
$S_{B_d \rightarrow K^* \gamma}$	$\text{few} \times 0.01$	0.01	-0.16 ± 0.22	0.03	Super- B
$S_{B_s \rightarrow \phi \gamma}$	$\text{few} \times 0.01$	0.01	—	0.05	LHCb
A_{SL}^d	-5×10^{-4}	10^{-4}	$-(5.8 \pm 3.4) \times 10^{-3}$	10^{-3}	LHCb
A_{SL}^s	2×10^{-5}	$< 10^{-5}$	$(1.6 \pm 8.5) \times 10^{-3}$	10^{-3}	LHCb
$A_{CP}(b \rightarrow s \gamma)$	< 0.01	< 0.01	-0.012 ± 0.028	0.005	Super- B
$\mathcal{B}(B \rightarrow \tau \nu)$	1×10^{-4}	$20\% \rightarrow 5\%_{\text{Latt}}$	$(1.73 \pm 0.35) \times 10^{-4}$	5%	Super- B
$\mathcal{B}(B \rightarrow \mu \nu)$	4×10^{-7}	$20\% \rightarrow 5\%_{\text{Latt}}$	$< 1.3 \times 10^{-6}$	6%	Super- B
$\mathcal{B}(B_s \rightarrow \mu^+ \mu^-)$	3×10^{-9}	$20\% \rightarrow 5\%_{\text{Latt}}$	$< 5 \times 10^{-8}$	10%	LHCb
$\mathcal{B}(B_d \rightarrow \mu^+ \mu^-)$	1×10^{-10}	$20\% \rightarrow 5\%_{\text{Latt}}$	$< 1.5 \times 10^{-8}$	[?]	LHCb
$A_{\text{FB}}(B \rightarrow K^* \mu^+ \mu^-)_{q_0^2}$	0	0.05	(0.2 ± 0.2)	0.05	LHCb
$B \rightarrow K \nu \bar{\nu}$	4×10^{-6}	$20\% \rightarrow 10\%_{\text{Latt}}$	$< 1.4 \times 10^{-5}$	20%	Super- B
$ q/p _{D\text{-mixing}}$	1	$< 10^{-3}$	$(0.86^{+0.18}_{-0.15})$	0.03	Super- B
ϕ_D	0	$< 10^{-3}$	$(9.6^{+8.3}_{-9.5})^\circ$	2°	Super- B
$\mathcal{B}(K^+ \rightarrow \pi^+ \nu \bar{\nu})$	8.5×10^{-11}	8%	$(1.73^{+1.15}_{-1.05}) \times 10^{-10}$	10%	K factory
$\mathcal{B}(K_L \rightarrow \pi^0 \nu \bar{\nu})$	2.6×10^{-11}	10%	$< 2.6 \times 10^{-8}$	[?]	K factory
$R^{(e/\mu)}(K \rightarrow \pi \ell \nu)$	2.477×10^{-5}	0.04%	$(2.498 \pm 0.014) \times 10^{-5}$	0.1%	K factory
$\mathcal{B}(t \rightarrow c Z, \gamma)$	$\mathcal{O}(10^{-13})$	$\mathcal{O}(10^{-13})$	$< 0.6 \times 10^{-2}$	$\mathcal{O}(10^{-5})$	LHC (100 fb $^{-1}$)

TABLE VIII: Status and prospects of selected $B_{s,d}$, D , K and t observables (based on information from Ref. [46, 91, 92]). In the third column “Latt” refer to improvements in Lattice QCD expected in the next 5 years. In the fourth column the bounds are 90% CL. The errors in the fifth column refer to 10 fb $^{-1}$ at LHCb, 50 ab $^{-1}$ at Super- B , and two years at NA62 (“ K factory”). In the third and fifth column the errors followed by “%” are relative errors, while the others are absolute errors. For entries marked “[?]” we have not found a reliable estimate of the future experimental prospects.