

Heavy Flavor Averaging Group
December 2011

Compilation of B_s Rare Branching Fractions
All branching fractions are in units of 10^{-6}

In PDG2010 New since PDG2010 (preliminary) New since PDG2010 (published)

| RPP# | Mode | PDG2010 Avg. | Belle | CDF | D0 | LHCb | CMS | New Avg. |
|------|----------------------|------------------------|------------------------|----------------------------------|-------------------|---------------------------------|-------------------|-------------------|
| 15 | $\pi^+\pi^-$ | < 1.2 | < 12 | $0.57 \pm 0.15 \pm 0.10^\dagger$ | | $0.98^{+0.23}_{-0.19} \pm 0.11$ | | 0.73 ± 0.14 |
| 21 | $\phi\phi$ | 14 ± 8 | | $23.2 \pm 1.8 \pm 8.2^\dagger$ | | | | 23.2 ± 8.4 |
| 22 | π^+K^- | 4.9 ± 1.0 | < 26 | $5.0 \pm 0.7 \pm 0.8^\dagger$ | | | | 5.0 ± 1.1 |
| 23 | K^+K^- | 33 ± 9 | $38^{+10}_{-9} \pm 7$ | $23.9 \pm 1.4 \pm 3.6^\dagger$ | | | | 25.4 ± 3.7 |
| – | $K^0\bar{K}^0$ | New | < 66 | | | | | < 66 |
| 25 | $K^{*0}\bar{K}^{*0}$ | New | | | | $28.1 \pm 4.6 \pm 4.6$ | | 28.1 ± 6.5 |
| 28 | $\gamma\gamma$ | < 8.7 | < 8.7 | | | | | < 8.7 |
| 29 | $\phi\gamma$ | 57^{+18+12}_{-15-11} | 57^{+18+12}_{-15-11} | | | | | 57^{+21}_{-18} |
| 30 | $\mu^+\mu^-$ | < 0.047 | | $< 0.035^\dagger$ | $< 0.042^\dagger$ | $< 0.012^\dagger$ | $< 0.016^\dagger$ | $< 0.012^\dagger$ |
| 31 | e^+e^- | < 0.28 | | $< 0.28^\dagger$ | | | | $< 0.28^\dagger$ |
| 32 | $e^\pm\mu^\mp$ | < 0.20 | | $< 0.20^\dagger$ | | | | $< 0.20^\dagger$ |
| 33 | $\phi\mu^+\mu^-$ | < 3.2 | | $1.47 \pm 0.24 \pm 0.46^\dagger$ | $< 3.2^\dagger$ | | | 1.47 ± 0.52 |

† Relative BF converted to absolute BF

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Compilation of B_s^0 Rare Relative Branching Fractions (UL 90% CL)

In PDG2010 New since PDG2010 (preliminary) New since PDG2010 (published)

| RPP# | Mode | PDG2010 Avg. | CDF | D0 | New Avg. |
|------|--|--------------|---|------------------------|-------------------|
| 13 | $f_s \mathcal{B}(B_s^0 \rightarrow \pi^+ \pi^-) / f_d \mathcal{B}(B^0 \rightarrow K^+ \pi^-)$ | | $0.008 \pm 0.002 \pm 0.001$ | | 0.008 ± 0.002 |
| 19 | $\mathcal{B}(B_s^0 \rightarrow \phi \phi) / \mathcal{B}(B_s^0 \rightarrow J/\psi \phi)$ | | $(1.78 \pm 0.14 \pm 0.20) \times 10^{-2}$ | | 1.78 ± 0.24 |
| 20 | $f_s \mathcal{B}(B_s^0 \rightarrow K^+ \pi^-) / f_d \mathcal{B}(B_d^0 \rightarrow K^+ \pi^-)$ | | $0.071 \pm 0.010 \pm 0.007$ | | 0.071 ± 0.012 |
| 21 | $f_s \mathcal{B}(B_s^0 \rightarrow K^+ K^-) / f_d \mathcal{B}(B_d^0 \rightarrow K^+ \pi^-)$ | | $0.347 \pm 0.020 \pm 0.021$ | | 0.347 ± 0.029 |
| 31 | $\mathcal{B}(B_s^0 \rightarrow \phi \mu^+ \mu^-) / \mathcal{B}(B_s^0 \rightarrow J/\psi \phi)$ | | $(1.11 \pm 0.25 \pm 0.09) \times 10^{-3}$ | $< 3.5 \times 10^{-3}$ | 1.11 ± 0.27 |

Charmless B_s Decays: CDF References

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