

BOTTOM, CHARMED MESONS

($B = C = \pm 1$)

$$B_c^+ = c\bar{b}, B_c^- = \bar{c}b, \quad \text{similarly for } B_c^{*'}\text{'s}$$

B_c^+

$$I(J^P) = 0(0^-)$$

I, J, P need confirmation.

Quantum numbers shown are quark-model predictions.

$$\text{Mass } m = 6274.47 \pm 0.32 \text{ MeV}$$

$$m_{B_c^+} - m_{B_s^0} = 907.8 \pm 0.5 \text{ MeV}$$

$$\text{Mean life } \tau = (0.510 \pm 0.009) \times 10^{-12} \text{ s}$$

The following quantities are not pure branching ratios; rather the fractions $\Gamma_i/\Gamma \times B(\bar{b} \rightarrow B_c^-)$. B_c^- modes are charge conjugates of the modes below.

B_c^+ DECAY MODES $\times B(\bar{b} \rightarrow B_c^-)$	Fraction (Γ_i/Γ)	Confidence level	P (MeV/c)
$J/\psi(1S)\ell^+\nu_\ell$ anything	seen		—
$J/\psi(1S)\mu^+\nu_\mu$	seen		2372
$J/\psi(1S)\tau^+\nu_\tau$	seen		1932
$J/\psi(1S)\pi^+$	seen		2370
$J/\psi(1S)K^+$	seen		2341
$J/\psi(1S)\pi^+\pi^+\pi^-$	seen		2350
$J/\psi(1S)a_1(1260)$	not seen		2169
$J/\psi(1S)K^+K^-\pi^+$	seen		2203
$J/\psi(1S)\pi^+\pi^+\pi^+\pi^-\pi^-$	seen		2309
$\psi(2S)\pi^+$	seen		2051
$J/\psi(1S)D^0K^+$	seen		1539
$J/\psi(1S)D^*(2007)^0K^+$	seen		1411
$J/\psi(1S)D^*(2010)^+K^{*0}$	seen		919
$J/\psi(1S)D^+K^{*0}$	seen		1122
$J/\psi(1S)D_s^+$	seen		1821
$J/\psi(1S)D_s^{*+}$	seen		1727
$J/\psi(1S)p\bar{p}\pi^+$	seen		1791
$p\bar{p}\pi^+$	not seen		2970
D^0K^+	seen		2837
$D^0\pi^+$	not seen		2858
$D^{*0}\pi^+$	not seen		2814
$D^{*0}K^+$	not seen		2792
$D_s^+\bar{D}^0$	$<7.2 \times 10^{-4}$	90%	2483

$D_s^+ D^0$	$<3.0 \times 10^{-4}$	90%	2483
$D_s^+ \bar{D}^0$	$<1.9 \times 10^{-4}$	90%	2521
$D^+ D^0$	$<1.4 \times 10^{-4}$	90%	2521
$D_s^{*+} \bar{D}^0$	$<5.3 \times 10^{-4}$	90%	2425
$D_s^+ \bar{D}^*(2007)^0$	$<4.6 \times 10^{-4}$	90%	2427
$D_s^{*+} D^0$	$<9 \times 10^{-4}$	90%	2425
$D_s^+ D^*(2007)^0$	$<6.6 \times 10^{-4}$	90%	2427
$D^*(2010)^+ \bar{D}^0$	$<3.8 \times 10^{-4}$	90%	2467
$D^*(2010)^+ \bar{D}^0, D^{*+} \rightarrow D^+ \pi^0 / \gamma$	not seen		—
$D^+ \bar{D}^*(2007)^0$	$<6.5 \times 10^{-4}$	90%	2466
$D^*(2007)^+ D^0$	$<2.0 \times 10^{-4}$	90%	—
$D^*(2010)^+ D^0, D^{*+} \rightarrow D^+ \pi^0 / \gamma$	not seen		2467
$D^+ D^*(2007)^0$	$<3.7 \times 10^{-4}$	90%	2466
$D_s^{*+} \bar{D}^*(2007)^0$	$<1.3 \times 10^{-3}$	90%	2366
$D_s^{*+} D^*(2007)^0$	$<1.3 \times 10^{-3}$	90%	2366
$D^*(2010)^+ \bar{D}^*(2007)^0$	$<1.0 \times 10^{-3}$	90%	2410
$D^*(2010)^+ D^*(2007)^0$	$<7.7 \times 10^{-4}$	90%	2410
$D^+ K^{*0}$	not seen		2783
$D^+ \bar{K}^{*0}$	not seen		2783
$D_s^+ K^{*0}$	not seen		2751
$D_s^+ \bar{K}^{*0}$	not seen		2751
$D_s^+ \phi$	not seen		2727
$K^+ K^0$	not seen		3098
$B_s^0 \pi^+ / B(\bar{b} \rightarrow B_s)$	seen		—

$B_c(2S)^\pm$

$I(J^P) = 0(0^-)$

Mass $m = 6871.2 \pm 1.0$ MeV

The following quantities are not pure branching ratios; rather the fractions $\Gamma_i / \Gamma \times B(\bar{b} \rightarrow B_c(2S))$.

$B_c(2S)^\pm$ DECAY MODES $\times B(\bar{b} \rightarrow B_c(2S))$	Fraction (Γ_i / Γ)	p (MeV/c)
$B_c^+ \pi^+ \pi^-$	seen	504