



$$I(J^P) = 0(\frac{1}{2}^+)$$

$$\text{Charge} = \frac{2}{3} e \quad \text{Charm} = +1$$

c-QUARK MASS

The c -quark mass is estimated from charmonium and D masses. It corresponds to the “running” mass $m_c(\mu = m_c)$ in the $\overline{\text{MS}}$ scheme. We have converted masses in other schemes to the $\overline{\text{MS}}$ scheme using two-loop QCD perturbation theory with $\alpha_s(\mu=m_c) = 0.39$. The range 1.0–1.4 GeV for the $\overline{\text{MS}}$ mass corresponds to 1.47–1.83 GeV for the pole mass (see the “Note on Quark Masses”).

VALUE (GeV)	DOCUMENT ID	TECN	COMMENT
1.0 to 1.4 OUR EVALUATION			
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
1.26 ±0.04 ±0.01	¹ BECIVERIC 02	LATT	$\overline{\text{MS}}$ scheme
1.23 ±0.09	² EIDEMULLER 01	THEO	$\overline{\text{MS}}$ scheme
1.304 ±0.027	³ KUHN 01	THEO	$\overline{\text{MS}}$ scheme
1.04 ±0.04	⁴ MARTIN 01	THEO	$\overline{\text{MS}}$ scheme
1.1 ±0.04	⁵ NARISON 01B	THEO	$\overline{\text{MS}}$ scheme
1.37 ±0.09	⁶ PENARROCHA 01	THEO	$\overline{\text{MS}}$ scheme
1.3 ±0.3 ±0.3	⁷ ASTIER 00D	NOMD	
1.79 ±0.38	⁸ VILAIN 99	THEO	$\overline{\text{MS}}$ scheme

¹ BECIVERIC 02 uses Monte-Carlo calculations of lattice Ward identities and the D_s mass.

² EIDEMULLER 01 result is QCD sum rule analysis of charmonium using NRQCD at next-to-next-to-leading order.

³ KUHN 01 uses an analysis of the e^+e^- total cross section to hadrons.

⁴ MARTIN 01 obtain a pole mass of 1.33–1.4 GeV from an analysis of R , the rate for $e^+e^- \rightarrow$ hadrons. We have converted this to the $\overline{\text{MS}}$ scheme using the two-loop formula.

⁵ NARISON 01B uses pseudoscalar sum rules in the B and D meson channels.

⁶ PENARROCHA 01 result is from an analysis of the BES-II e^+e^- data using finite energy sum rules.

⁷ Study of opposite sign dimuon events.

⁸ VILAIN 99 obtain the charm quark mass from an analysis of charm production in neutrino scattering.

c-QUARK REFERENCES

BECIVERIC 02	PL B524 115	D. Beciveric, V. Lubicz, G. Martinelli
EIDEMULLER 01	PL B498 203	M. Eidemueller, M. Jamin
KUHN 01	NP B619 588	J.H. Kuhn, M. Steinhauser
MARTIN 01	EPJ C19 681	A.D. Martin, J. Outhwaite, M.G. Ryskin
NARISON 01B	PL B520 115	S. Narison
PENARROCHA 01	PL B515 291	J. Penarrocha, K. Schilcher
ASTIER 00D	PL B486 35	P. Astier <i>et al.</i> (CERN NOMAD Collab.)
VILAIN 99	EPJ C11 19	P. Vilain <i>et al.</i> (CHARM II Collab.)