C

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

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

c-QUARK MASS

The c-quark mass is estimated from charmonium and D masses. It corresponds to the "running" mass in the $\overline{\text{MS}}$ scheme. We have converted masses in other schemes to the $\overline{\text{MS}}$ scheme using one-loop QCD pertubation theory with $\alpha_s(\mu=m_c) = 0.39$. The range 1.0–1.6 GeV for the $\overline{\text{MS}}$ mass corresponds to 1.2–1.9 GeV for the pole mass (see the "Note on Quark Masses").

VALUE (GeV)		*DOCUMENT ID*		*TECN*	*COMMENT*
1.0 to 1.6 OUR EVALUATION					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.22 ± 0.06		[1] DOMINGUEZ	94	THEO	Assumes $\overline{\text{MS}}$ scheme
≥ 1.23		[2] LIGETI	94	THEO	Assumes $\overline{\text{MS}}$ scheme
≥ 1.25		[3] LUKE	94	THEO	Assumes $\overline{\text{MS}}$ scheme
1.23 ± 0.04		[4] NARISON	94	THEO	Assumes $\overline{\text{MS}}$ scheme
1.31 ± 0.03		[5] TITARD	94	THEO	Assumes $\overline{\text{MS}}$ scheme
$1.5\ ^{+0.2}_{-0.1} \pm 0.2$		[6] ALVAREZ	93	THEO	
1.27 ± 0.02		[7] NARISON	89	THEO	
1.25 ± 0.05		[8] NARISON	87	THEO	
1.27 ± 0.05		[9] GASSER	82	THEO	

[1] DOMINGUEZ 94 uses QCD sum rules for $J/\psi(1S)$ system and finds a pole mass of 1.46 ± 0.07 GeV.
[2] LIGETI 94 computes lower bound of 1.43 GeV on pole mass using HQET, and experimental data on inclusive B and D decays.
[3] LUKE 94 computes lower bound of 1.46 GeV on pole mass using HQET, and experimental data on inclusive B and D decays.
[4] NARISON 94 uses spectral sum rules to two loops, and $J/\psi(1S)$ and Υ systems.
[5] TITARD 94 uses one-loop computation of the quark potential with nonperturbative gluon condensate effects to fit $J/\psi(1S)$ and Υ states.
[6] ALVAREZ 93 method is to fit the measured x_F and p_T^2 charm photoproduction distributions to the theoretical predictions of ELLIS 89C.
[7] NARISON 89 determines the Georgi-Politzer mass at $p^2 = -m^2$ to be 1.26 ± 0.02 GeV using QCD sum rules.
[8] NARISON 87 computes pole mass of 1.46 ± 0.05 GeV using QCD sum rules, with $\Lambda(\overline{\text{MS}})$ = 180 ± 80 MeV.
[9] GASSER 82 uses SVZ sum rules. The renormalization point is μ = quark mass.

c-QUARK REFERENCES

DOMINGUEZ	94	PL B333 184	+Gluckman, Paver	(CAPE, TRST, INFN)
LIGETI	94	PR D49 R4331	+Nir	(REHO)
LUKE	94	PL B321 88	+Savage	(TNTO, UCSD, CMU)
NARISON	94	PL B341 73		(CERN, MONP)
TITARD	94	PR D49 6007	+Yndurain	(MICH, MADU)
ALVAREZ	93	ZPHY C60 53	+Barate, Bloch, Bonamy+	(CERN NA14/2 Collab.)
ELLIS	89C	NP B312 551	+Nason	(FNAL, ETH)
NARISON	89	PL B216 191		(ICTP)
NARISON	87	PL B197 405		(CERN)
GASSER	82	PRPL 87 77	+Leutwyler	(BERN)