

STANDARD MODEL VARIANTS (E2)

u Up	c Charm	t Top	\bar{u} Antiup	\bar{c} Anticharm	\bar{t} Antitop
d Down	s Strange	b Bottom	\bar{d} Antidown	\bar{s} Antistrange	\bar{b} Antibottom

e^- Electron	μ^- Muon	τ^- Tau	e^+ Positron	μ^+ Antimuon	τ^+ Antitau
ν_e Electron Neutrino	ν_μ Muon Neutrino	ν_τ Tau Neutrino	$\bar{\nu}_e$ Electron Antineutrino	$\bar{\nu}_\mu$ Muon Antineutrino	$\bar{\nu}_\tau$ Tau Antineutrino

g Gluon

γ Photon

Z Z ⁰ Boson

W⁺ W ⁺ Boson
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W⁻ W ⁻ Boson
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H Higgs

Elementary Fermions Elementary Antifermions

Quarks

I	II	III	I	II	III
2.16 MeV $\frac{1}{2}$ u Up	1.27 GeV $\frac{1}{2}$ c Charm	172.69 GeV $\frac{1}{2}$ t Top	2.16 MeV $\frac{1}{2}$ \bar{u} Antiup	1.27 GeV $\frac{1}{2}$ \bar{c} Anticharm	172.69 GeV $\frac{1}{2}$ \bar{t} Antitop
4.67 MeV $\frac{1}{2}$ d Down	93.4 MeV $\frac{1}{2}$ s Strange	4.18 GeV $\frac{1}{2}$ b Bottom	4.67 MeV $\frac{1}{2}$ \bar{d} Antidown	93.4 MeV $\frac{1}{2}$ \bar{s} Antistrange	4.18 GeV $\frac{1}{2}$ \bar{b} Antibottom

Leptons

I	II	III	I	II	III
0.51 MeV $\frac{1}{2}$ e^- Electron	105.66 MeV $\frac{1}{2}$ μ^- Muon	1.78 GeV $\frac{1}{2}$ τ^- Tau	0.51 MeV $\frac{1}{2}$ e^+ Positron	105.66 MeV $\frac{1}{2}$ μ^+ Antimuon	1.78 GeV $\frac{1}{2}$ τ^+ Antitau
< 1.10 eV $\frac{1}{2}$ ν_e Electron Neutrino	< 0.19 MeV $\frac{1}{2}$ ν_μ Muon Neutrino	< 18.20 MeV $\frac{1}{2}$ ν_τ Tau Neutrino	< 1.10 eV $\frac{1}{2}$ $\bar{\nu}_e$ Electron Antineutrino	< 0.19 MeV $\frac{1}{2}$ $\bar{\nu}_\mu$ Muon Antineutrino	< 18.20 MeV $\frac{1}{2}$ $\bar{\nu}_\tau$ Tau Antineutrino

Elementary Bosons

Gauge Bosons

0.00 eV 0 1 g Gluon
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> 0.00 eV 0 1 γ Photon

91.19 GeV 0 1 Z Z ⁰ Boson

80.38 GeV 1 1 W⁺ W ⁺ Boson

80.38 GeV -1 1 W⁻ W ⁻ Boson
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Scalar Bosons

125.25 GeV 0 0 H Higgs

$+\frac{2}{3}$ $\frac{1}{3}$ u Up	$-\frac{1}{3}$ $\frac{1}{3}$ d Down
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$+\frac{2}{3}$ $\frac{1}{3}$ u Up	$+\frac{2}{3}$ $\frac{1}{3}$ c Charm	$+\frac{2}{3}$ $\frac{1}{3}$ t Top
$-\frac{1}{3}$ $\frac{1}{3}$ d Down	$-\frac{1}{3}$ $\frac{1}{3}$ s Strange	$-\frac{1}{3}$ $\frac{1}{3}$ b Bottom

$\frac{1}{3}$ $\frac{2}{3}$ u Up	$\frac{1}{3}$ $\frac{2}{3}$ c Charm	$\frac{1}{3}$ $\frac{2}{3}$ t Top	$\frac{1}{3}$ $-\frac{2}{3}$ \bar{u} Antiup	$\frac{1}{3}$ $-\frac{2}{3}$ \bar{c} Anticharm	$\frac{1}{3}$ $-\frac{2}{3}$ \bar{t} Antitop
$\frac{1}{3}$ $-\frac{1}{3}$ d Down	$\frac{1}{3}$ $-\frac{1}{3}$ s Strange	$\frac{1}{3}$ $-\frac{1}{3}$ b Bottom	$\frac{1}{3}$ $\frac{1}{3}$ \bar{d} Antidown	$\frac{1}{3}$ $\frac{1}{3}$ \bar{s} Antistrange	$\frac{1}{3}$ $\frac{1}{3}$ \bar{b} Antibottom