

8.4: SU(4), SU(5), and SU(6) flavor symmetries

Once we have three flavors of quarks, we can ask the question whether more flavors exists. At the moment we know of three generations of quarks, corresponding to three generations (pairs). These give rise to SU(4), SU(5), SU(6) flavor symmetries. Since the quarks get heavier and heavier, the symmetries get more-and-more broken as we add flavors.

The properties of the three quarks.

Quark	label	spin	Q/e	mass (GEV/c ²)
Down	d	$\frac{1}{2}$	$-\frac{1}{3}$	0.35
Up	u	$\frac{1}{2}$	$+\frac{2}{3}$	0.35
Strange	s	$\frac{1}{2}$	$-\frac{1}{3}$	0.5
Charm	c	$\frac{1}{2}$	$+\frac{2}{3}$	1.5
Bottom	b	$\frac{1}{2}$	$-\frac{1}{3}$	4.5
Top	t	$\frac{1}{2}$	$+\frac{2}{3}$	93

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