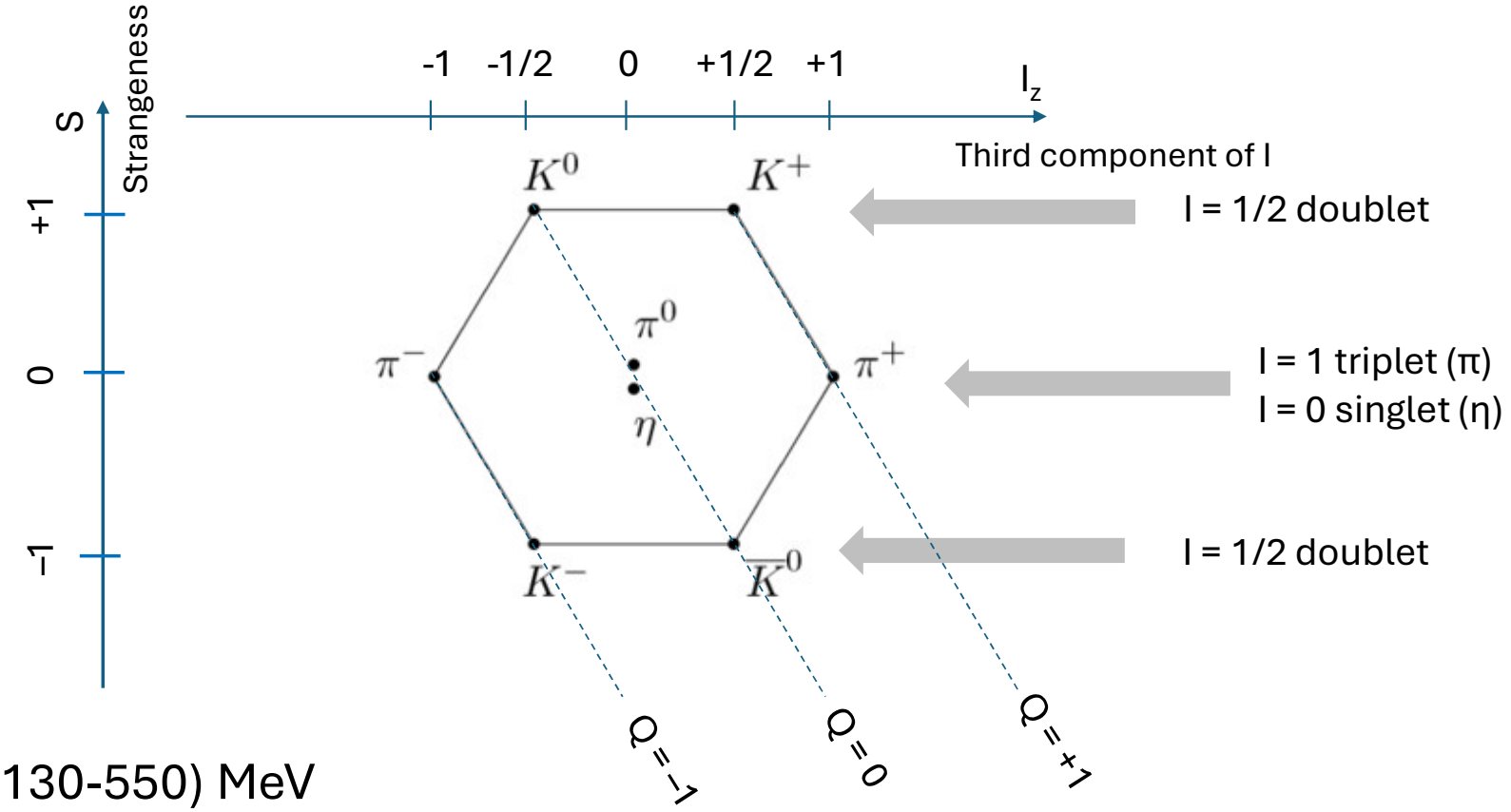
Hadrons (1)



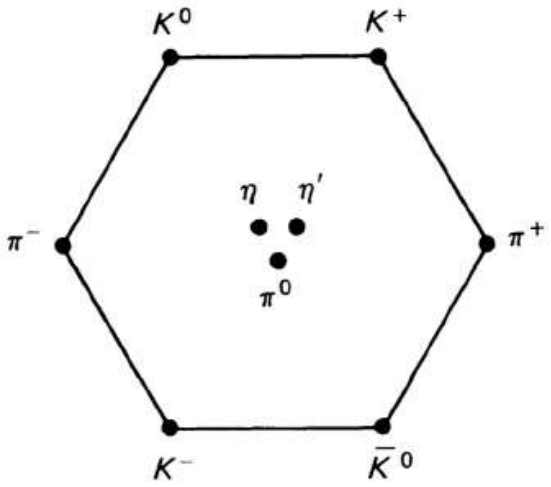
Masses: O(130-550) MeV

Octet of pseudo-scalar mesons

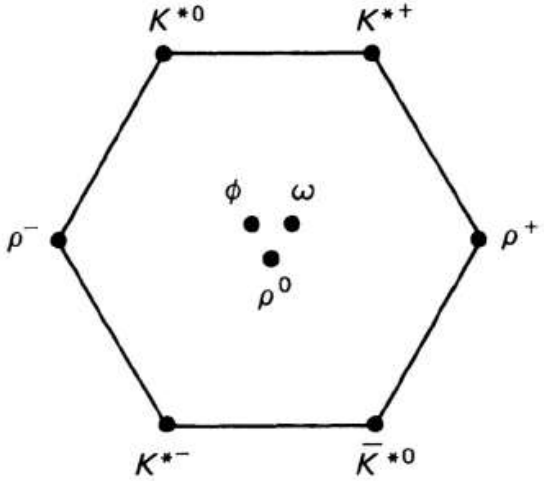
Light-quark mesons

(u,d,s) quarks only

L=0



Pseudoscalar (0^{-+})



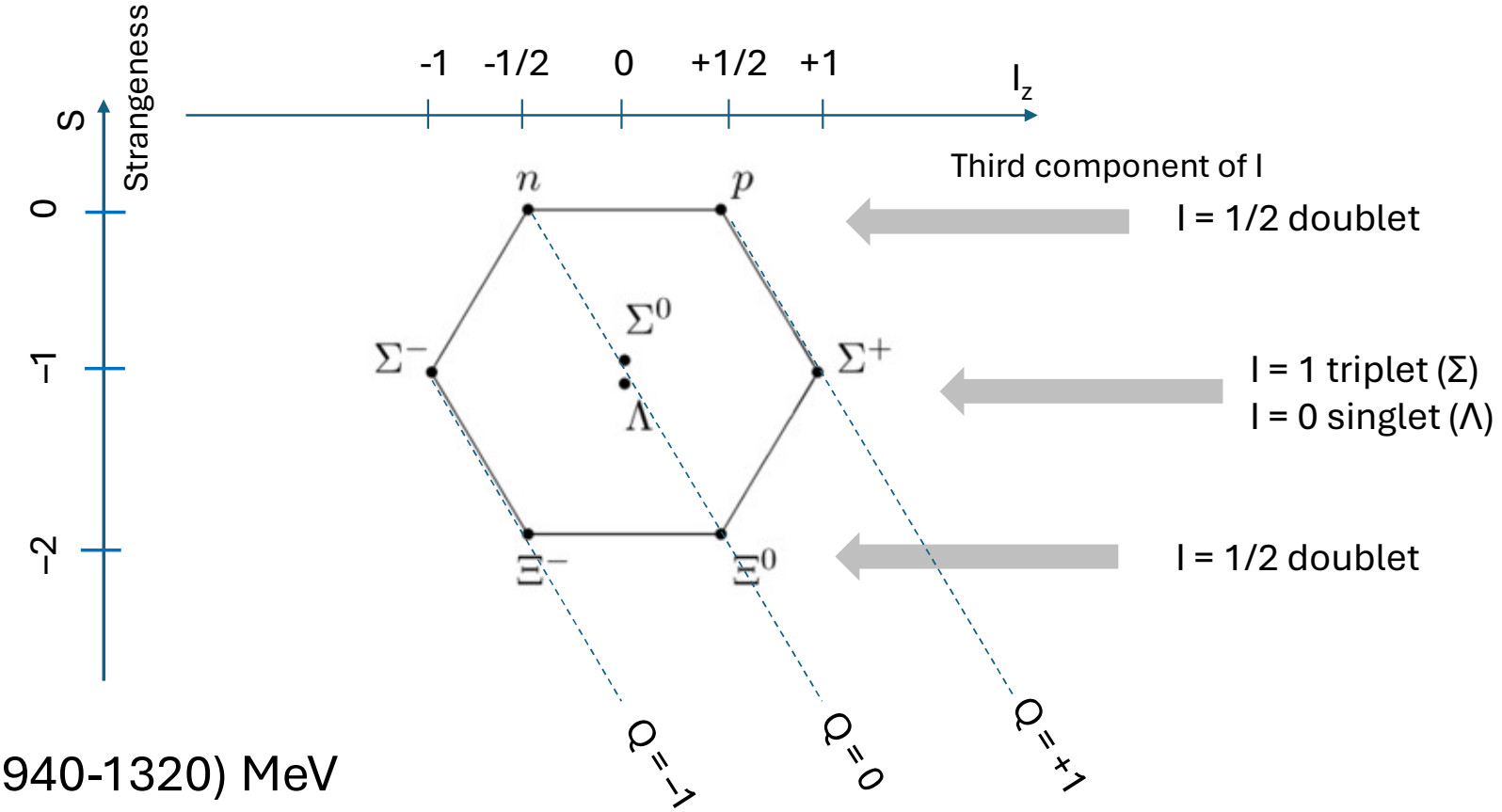
Vector (1^{--})

PSEUDOSCALAR AND VECTOR MESON MASSES (MeV/c^2)

Meson	Calculated	Observed
π	140	138
K	484	496
η	559	549
ρ	780	776
ω	780	783
K^*	896	892
ϕ	1032	1020

η' is an exception (mixing)

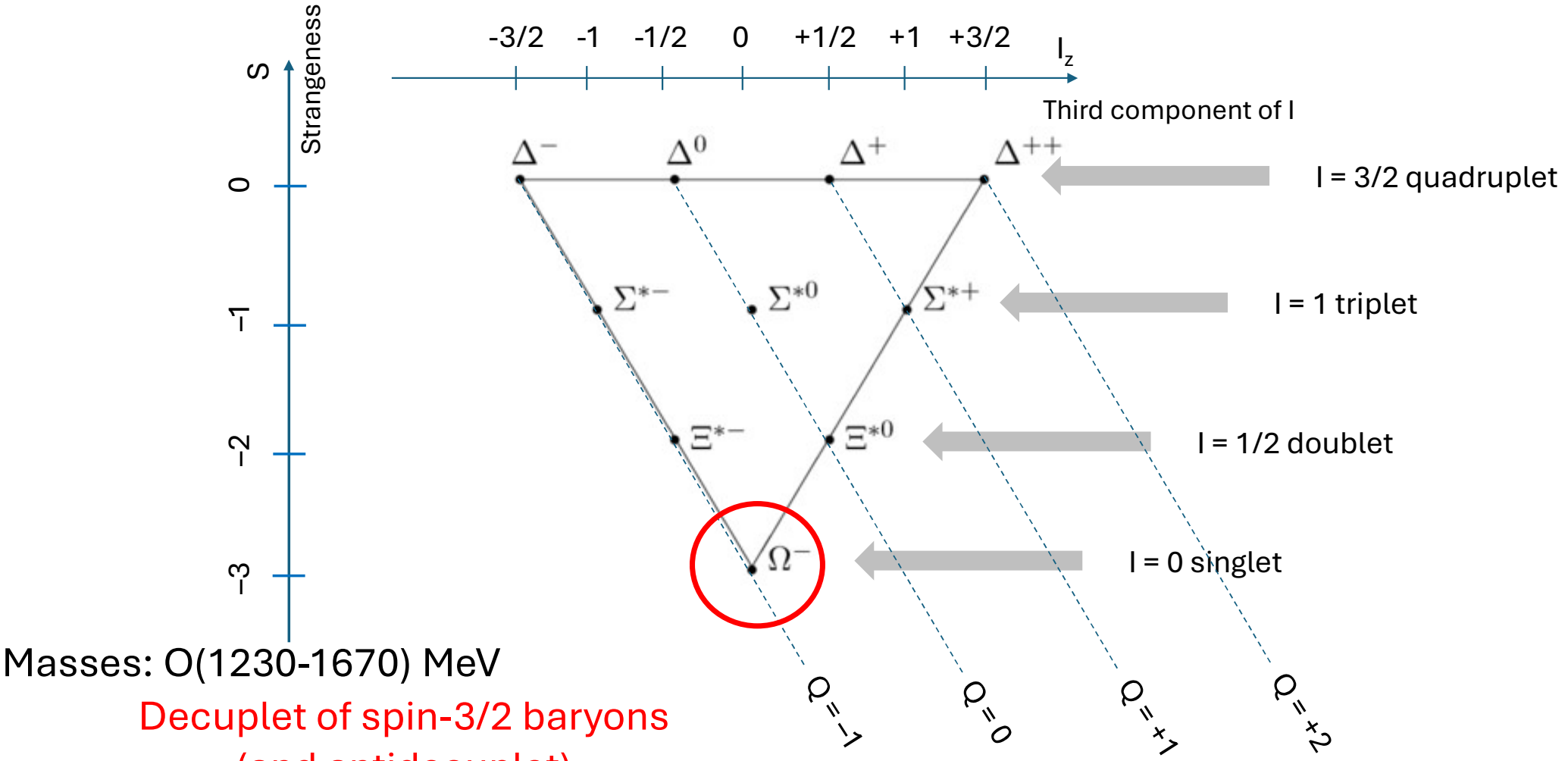
Hadrons (2)



Masses: O(940-1320) MeV

Octet of spin-1/2 baryons (and antioctet)

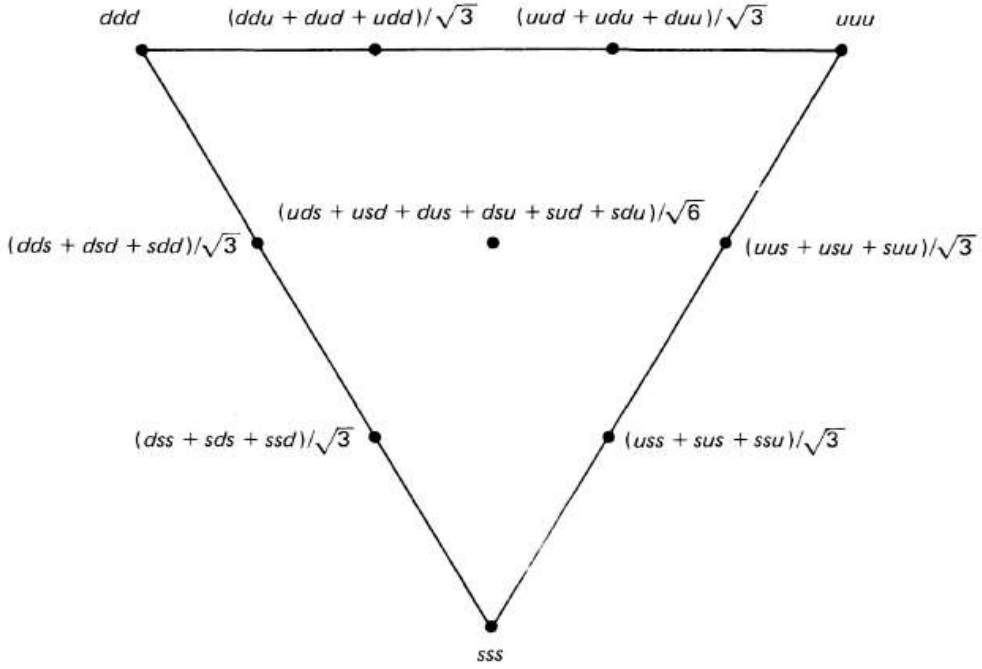
Hadrons (3)



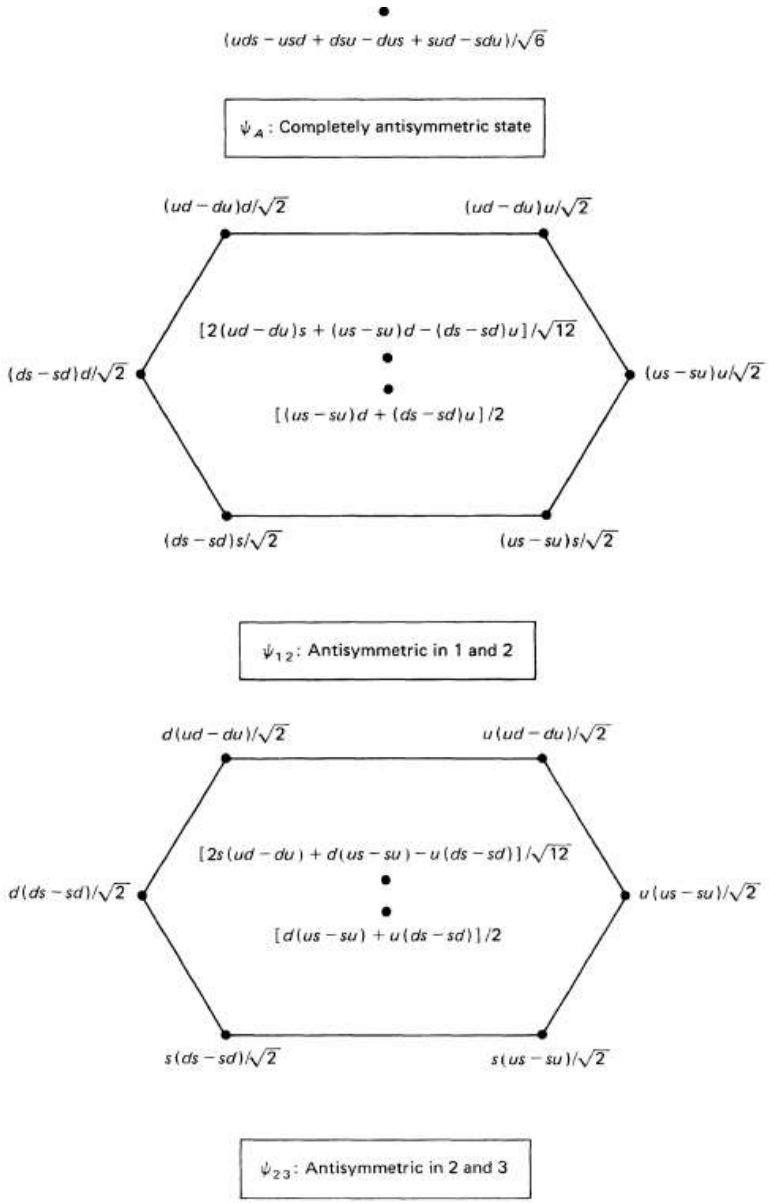
Masses: O(1230-1670) MeV

Decuplet of spin-3/2 baryons
(and antidecuplet)

Light-quark baryons



ψ_s: Completely symmetric states



ψ_A: Completely antisymmetric state

ψ_{12}: Antisymmetric in 1 and 2

ψ_{23}: Antisymmetric in 2 and 3

Light-quark baryons

(u,d,s) quarks only

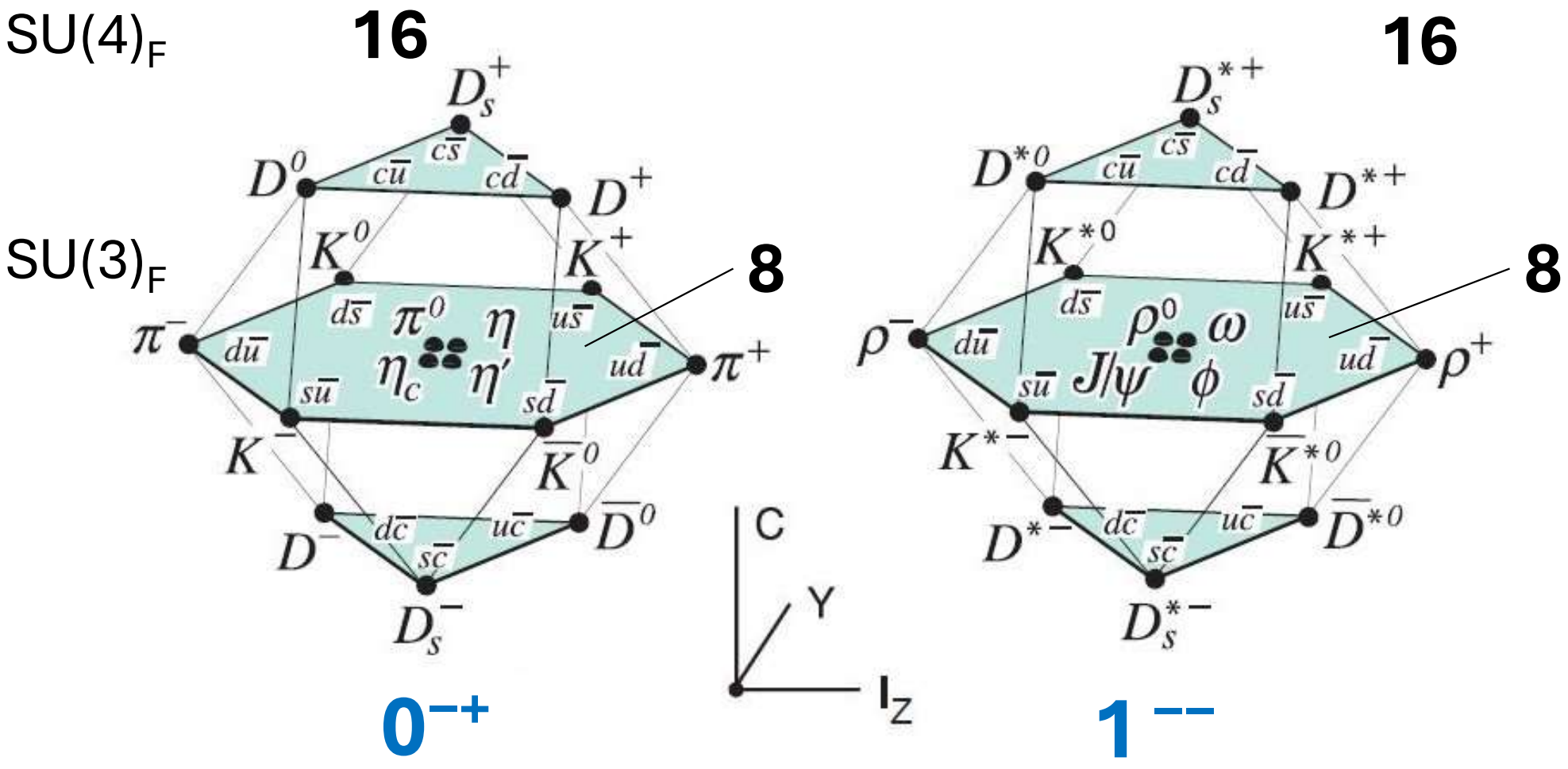
BARYON OCTET AND DECUPLET MASSES (MeV/c^2)

Baryon	Calculated	Observed
N	939	939
Λ	1116	1114
Σ	1179	1193
Ξ	1327	1318
Δ	1239	1232
Σ^*	1381	1384
Ξ^*	1529	1533
Ω	1682	1672

LIGHT-QUARK BARYONS (J = SPIN, P = PARITY, S = STRANGENESS, I = ISOSPIN. THIS IS NOT A COMPLETE LIST; BARYONS WITH SPINS AS HIGH AS $\frac{11}{2}$ HAVE BEEN OBSERVED.)

$SU(3)$ Representation	J^P	$S = 0$	$S = -1$, $I = 0$	$S = -1$, $I = 1$	$S = -2$	$S = -3$
8	$\frac{1}{2}^+$	$N(939)$	$\Lambda(1116)$	$\Sigma(1193)$	$\Xi(1318)$	
10	$\frac{3}{2}^+$	$\Delta(1232)$		$\Sigma(1385)$	$\Xi(1533)$	$\Omega(1672)$
1	$\frac{1}{2}^-$		$\Lambda(1405)$			
	$\frac{3}{2}^-$		$\Lambda(1520)$			
8	$\frac{1}{2}^-$	$N(1535)$	$\Lambda(1670)$	$\Sigma(1750)$		
	"	$N(1700)$	$\Lambda(1870)$			
	$\frac{3}{2}^-$	$N(1520)$	$\Lambda(1690)$	$\Sigma(1670)$	$\Xi(1820)$?	
	"	$N(1700)$		$\Sigma(1940)$?		
	$\frac{5}{2}^-$	$N(1670)$	$\Lambda(1830)$	$\Sigma(1765)$		
10	$\frac{1}{2}^-$	$\Delta(1650)$				
	$\frac{3}{2}^-$	$\Delta(1670)$				
8	$\frac{3}{2}^+$	$N(1810)$	$\Lambda(1860)$			
8	$\frac{5}{2}^+$	$N(1688)$	$\Lambda(1815)$	$\Sigma(1915)$	$\Xi(2030)$?	
10	$\frac{1}{2}^+$	$\Delta(1910)$				
	$\frac{3}{2}^+$					
	$\frac{5}{2}^+$	$\Delta(1890)$				
	$\frac{7}{2}^+$	$\Delta(1950)$		$\Sigma(2030)$		
8	$\frac{1}{2}^+$	$N(1470)$		$\Sigma(1660)$		
10	$\frac{3}{2}^+$	$\Delta(1690)$				

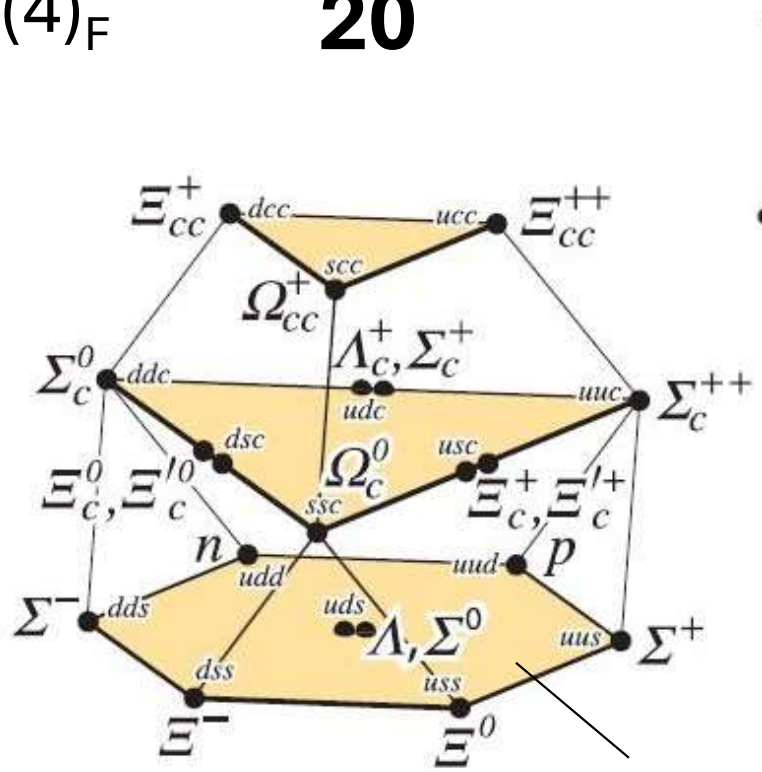
Mesons


SU(4)F
16
SU(3)F
8
D_s^+
D^0
$c\bar{u}$
$c\bar{s}$
$c\bar{d}$
D^+
K^0
K^+
$d\bar{s}$
π^0
η
$u\bar{s}$
π^-
$d\bar{u}$
η_c
η'
$u\bar{d}$
π^+
$s\bar{u}$
$s\bar{d}$
K^-
$\bar{K}^0$
D^-
$d\bar{c}$
$u\bar{c}$
$\bar{D}^0$
$s\bar{c}$
D_s^-
C
Y
I_Z
0^{-+}
16
D_s^{*+}
D^{*0}
D^{*+}
K^{*0}
K^{*+}
8
ρ^0
ω
ρ^-
J/ψ
ϕ
ρ^+
K^{*-}
$\bar{K}^{*0}$
D^{*-}
$\bar{D}^{*0}$
D_s^{*-}
1^{--}

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Baryons

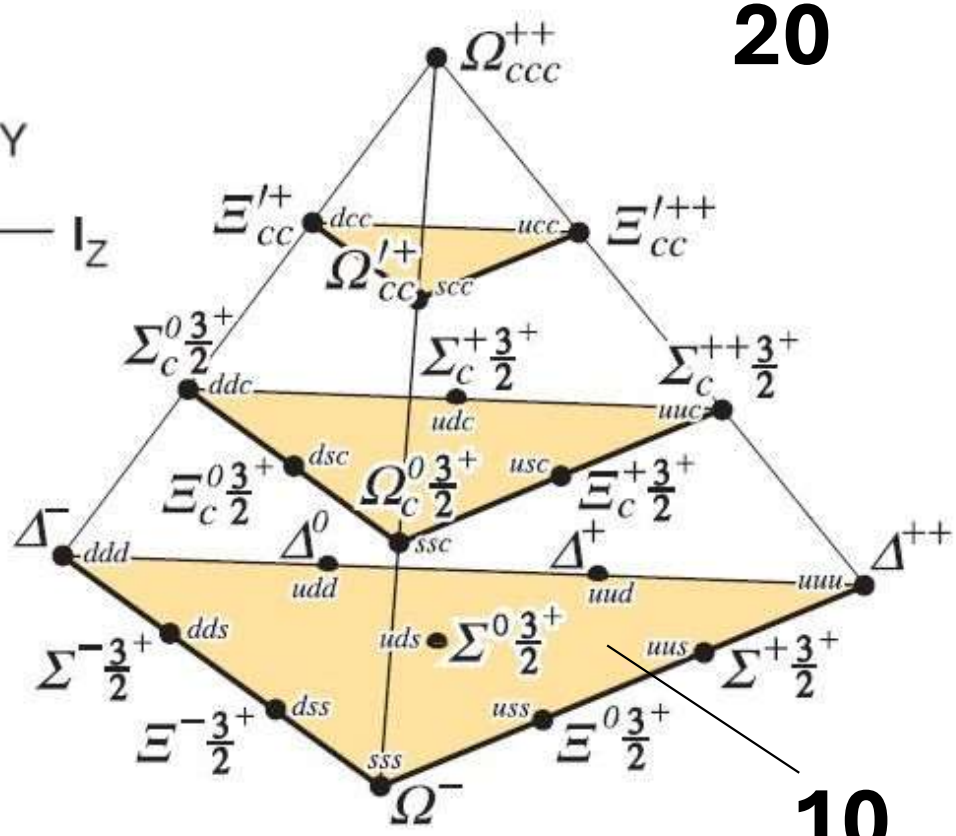
$SU(4)_F$ **20**



8

C
Y
I_Z

20



10

$SU(3)_F$

1/2 **3/2**

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