Top Quark Mass Confusion

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From 2011 to 2024 physicists at the LHC measured the top quark's mass 29 times, and got 29 different measurements over a range of about 6.5 GeV. Why weren't they able to zero in on it? Were they even measureing the top quark's mass? What were they measuring?

Is It the Top Quark's Mass or Just a Massive Hadron?

The top quark's mass measurements, in units of MeV/c^2, determined by the CMS Collaboration over the 13 year period from 2011 to 2024 are listed in a table on the next page from smallest to largest. Are they measurements of the top quark's mass or something else? As you can see from the table, many of the masses can be factored as *integer multiples of* **S10h**, or as an integer and a half, quarter, or eighth times **S10h**. For instance, the 18th top quark mass measurement listed in the table is 173,060 MeV, which matches **1024 S10h** very closely. What is **1024 S10h**?

1024 S10h Is Higher Dimensional Matter

S10 represents the surface volume formula of a 10-sphere: **S10**=$(1/12)\pi^5 r^9$, and **h** is Planck's constant's coefficient: **h**= 6.62607015 J-s. Particle physicists haven't seemed to realize it yet, but particle accelerators have been creating higher dimensional matter for decades. There is evidence that all hadrons are made of higher dimensional matter, which means that all quarks are made of higher dimensional matter as well, since they are what makes a hadron. Hadrons exist mainly in higher dimensional space, so to speak (there is actually no higher dimensional space, only higher dimensional matter.). What we experience of them is their *intersection* with our 3D "space" (the Higgs field). But if quarks are made of higher dimensional matter, and exist mainly in higher dimensional space, can they exist completely in our 3D "space" (the Higgs field)? No they can't. That's why quarks cannot be isolated. They can't exist entirely in our 3D "space", even for an instant because they are higher dimensional things, therefore the masses observed by the CMS Collaboration cannot be quark masses, top or otherwise. Besides that, quarks don't appear to have a fixed mass. They appear to have fixed shapes - that of of n-sphere surface volumes - but not fixed masses. For those reasons, the CMS Collaboration's top quark measurements must be measurements of the masses of large hadrons, specifically, as the factorings in the table shows, they are hadrons of dimension 9/10, that is, they are composed of 9-dimensional matter (quarks) that circulate in the surface of a 10-sphere.

CMS Physicists Did a Great Job Measuring

The masses measured by the CMS Collaboration's physicists were more accurate than they thought they were if **S10h** factoring is the correct factoring of the masses measured. Of the 23 factorings in the table, twenty of those theoretical masses were within 9 MeV of the corresponding experimetal mass. Ten were within 3 MeV of the corresponding experimental mass. Their experimental errors (+/-) were much higher - in the hundreds and even thousands of MeV. Comparing experimental errors to actual errors, shows that the experimentalists were much too conservative in assigning experimental errors. The *average experimental error* is probably at least 20 times larger than the *average actual error*, so the CMS physicists' accuracy is about 20 times greater than they presumed it was.

Top Quark Mass Measurements

Made by the CMS Collaboration from 2011 to 2024
and
Hypersphere Surface Volume Factorings of Them

#	Top Quark ExpMass	+/-	Top Quark ThrMass		HSS Volume Factoring		ExpM-ThrM MassDiff
1	170,500	800	170,496.43	=	**1009.000**	**S10h**	dm = 3.57
2	170,600	2700	170,602.04	=	**1009.625**	**S10h**	dm = 2.04
3	170,900	6000	170,897.75	=	**1011.375**	**S10h**	dm = 2.25
4	171,770	40	171,763.75	=	**1016.500**	**S10h**	dm = 6.25
5	172,130	320					
6	172,220	180	172,228.43	=	**1019.250**	**S10h**	dm = 8.43
7	172,250	80	172,249.56	=	**1019.375**	**S10h**	dm = .44
8	172,320	250					
9	172,330	140					
10	172,340	200					
11	172,350	160	172,355.17	=	**1020**	**S10h**	dm = 5.17
12	172,440	130	172,439.65	**=**	**1020.500**	**S10h**	dm = .35
13	172,500	400	172,503.02	=	**1020.875**	**S10h**	dm = 3.02
14	172,520	140	172,524.14	=	**1021**	**S10h**	dm = 4.14
15	172,600	400	172,608.63	=	**1021.500**	**S10h**	dm = 8.63
16	172,820	190	172,819.85	**=**	**1022.750**	**S10h**	dm = .14
17	172,950	770	172,946.58	=	**1023.500**	**S10h**	dm = 3.42
18	173,060	240	173,031.07	=	**1024**	**S10h**	dm = 28.93
19	173,200	1600	173,200.04	=	**1025**	**S10h**	dm = .04
20	173,400	1800	173,369.02	=	**1026**	**S10h**	dm = 30.97
21	173,490	430	173,495.75	=	**1026.750**	**S10h**	dm = 5.75
22	173,500	3000					
23	173,540	330	173,538.00	=	**1027**	**S10h**	dm = 2.00
24	173,680	200					
25	173,700	2100	173,706.97	=	**1028**	**S10h**	dm = 6.97
26	173,900	900	173,875.95	=	**1029**	**S10h**	dm = 24.05
27	174,300	2100	174,298.39	=	**1031.500**	**S10h**	dm = 1.60
28	175,500	4600	175,502.34	=	**1038.625**	**S10h**	dm = 2.34
29	177,000	3600	177,002.00	=	**1047.500**	**S10h**	dm = 2.00

Source of Top Quark Mass Data: arXiv.org:2403.01313v1 "Review of Top Quark Mass Measurements in CMS

APPENDIX A

Quark Assignments to n-Sphere Surface Volume Formulae

Sphere Dimension	Quark Names Old	Quark Names New		Corresponding n-Sphere Surface Formula
2	**u**	q1	=	$2\ \pi^1 r^1$
3	**d**	q2	=	$4\ \pi^1 r^2$
4	**s**	q3	=	$2\ \pi^2 r^3$
5	**c**	q4	=	$8/3\ \pi^2 r^4$
6	**b**	q5	=	$\pi^3 r^5$
7	**t**	q6	=	$16/15\ \pi^3 r^6$
8	------	q7	=	$1/3\ \pi^4 r^7$
9	------	q8	=	$32/105\ \pi^4 r^8$
10	------	q9	=	$1/12\ \pi^5 r^9$
11	------	q10	=	$64 / 945\ \pi^5 r^{10}$
12	------	q11	=	$1 / 60\ \pi^6 r^{11}$
13	------	q12	=	$128 / 10395\ \pi^6 r^{12}$
14	------	q13	=	$1 / 360\ \pi^7 r^{13}$
15	------	q14	=	$256 / 135135\ \pi^7 r^{14}$
16	------	q15	=	$1 / 2520\ \pi^8 r^{15}$
17	------	q16	=	$512 / 2027025\ \pi^8 r^{16}$
18	------	q17	=	$1 / 20160\ \pi^9 r^{17}$
19	------	q18	=	$1024 / 34459425\ \pi^9 r^{18}$
20	------	q19	=	$1 / 181440\ \pi^{10} r^{19}$
21	------	q20	=	$2048 / 654729075\ \pi^{10} r^{20}$

APPENDIX B

n-Sphere Surface Volume Formulae

(Dimension 2 - Dimension 21)

Sphere Dimension	Sn		Surface Volume Formula	(π, r) Powers
2	**S2**	=	$2 \ \pi^1 r^1$	(1, 1)
3	**S3**	=	$4 \ \pi^1 r^2$	(1, 2)
4	**S4**	=	$2 \ \pi^2 r^3$	(2, 3)
5	**S5**	=	$8/3 \ \pi^2 r^4$	(2, 4)
6	**S6**	=	$\pi^3 r^5$	(3, 5)
7	**S7**	=	$16/15 \ \pi^3 r^6$	(3, 6)
8	**S8**	=	$1/3 \ \pi^4 r^7$	(4, 7)
9	**S9**	=	$32/105 \ \pi^4 r^8$	(4, 8)
10	**S10**	=	$1/12 \ \pi^5 r^9$	(5, 9)
11	**S11**	=	$64 / 945 \ \pi^5 r^{10}$	(5, 10)
12	**S12**	=	$1 / 60 \ \pi^6 r^{11}$	(6, 11)
13	**S13**	=	$128 / 10395 \ \pi^6 r^{12}$	(6, 12)
14	**S14**	=	$1 / 360 \ \pi^7 r^{13}$	(7, 13)
15	**S15**	=	$256 / 135135 \ \pi^7 r^{14}$	(7, 14)
16	**S16**	=	$1 / 2520 \ \pi^8 r^{15}$	(8, 15)
17	**S17**	=	$512 / 2027025 \ \pi^8 r^{16}$	(8, 16)
18	**S18**	=	$1 / 20160 \ \pi^9 r^{17}$	(9, 17)
19	**S19**	=	$1024 / 34459425 \ \pi^9 r^{18}$	(9, 18)
20	**S20**	=	$1 / 181440 \ \pi^{10} r^{19}$	(10, 19)
21	**S21**	=	$2048 / 654729075 \ \pi^{10} r^{20}$	(10, 20)

APPENDIX C

Values of n-Sphere Surface Volume Units of Factorization

(Below **h** = 6.62607015 J-s, not 6.62607015 x 10^{-34} J-s)

(Dimension 2 - Dimension 21)

Sphere Dimension	Unit of Factorization		Formula		Value (MeV/c^2)
2	**S2h**	=	2 $\pi^1 r^1 h$	=	41.63282661
3	**S3h**	=	4 $\pi^1 r^2 h$	=	83.26565322
4	**S4h**	=	2 $\pi^2 r^3 h$	=	130.7933822
5	**S5h**	=	8/3 $\pi^2 r^4 h$	=	174.3911763
6	**S6h**	=	$\pi^3 r^5 h$	=	205.4497644
7	**S7h**	=	16/15 $\pi^3 r^6 h$	=	219.1464153
8	**S8h**	=	1/3 $\pi^4 r^7 h$	=	215.1464901
9	**S9h**	=	32/105 $\pi^4 r^8 h$	=	196.7053624
10	**S10h**	=	1/12 $\pi^5 r^9 h$	=	168.9756582
11	**S11h**	=	64 / 945 $\pi^5 r^{10} h$	=	137.3262492
12	**S12h**	=	1 / 60 $\pi^6 r^{11} h$	=	106.1705373
13	**S13h**	=	128 / 10395 $\pi^6 r^{12} h$	=	78.44057013
14	**S14h**	=	1 / 360 $\pi^7 r^{13} h$	=	55.59076334
15	**S15h**	=	256 / 135135 $\pi^7 r^{14} h$	=	37.91204905
16	**S16h**	=	1 / 2520 $\pi^8 r^{15} h$	=	24.94907624
17	**S17h**	=	512 / 2027025 $\pi^8 r^{16} h$	=	15.88056197
18	**S18h**	=	1 / 20160 $\pi^9 r^{17} h$	=	9.797479330
19	**S19h**	=	1024 / 34459425 $\pi^9 r^{18} h$	=	5.869441980
20	**S20h**	=	1 / 181440 $\pi^{10} r^{19} h$	=	3.419965454
21	**S21h**	=	2048 / 654729075 $\pi^{10} r^{20} h$	=	1.940989032

APPENDIX D

Smallest Formation Quarks per n-Sphere

(Dimension 2 - Dimension 21)

Sphere Dimension	Sn		Surface Volume Formula	(π, r) Powers	Formation Quarks	
2	**S2**	=	2 $\pi^1 r^1$	(1, 1)	u	
3	**S3**	=	4 $\pi^1 r^2$	(1, 2)	d	
4	**S4**	=	2 $\pi^2 r^3$	(2, 3)	du	di-quarks
5	**S5**	=	8/3 $\pi^2 r^4$	(2, 4)	dd	
6	**S6**	=	$\pi^3 r^5$	(3, 5)	ddu	tri-quarks
7	**S7**	=	16/15 $\pi^3 r^6$	(3, 6)	ddd	
8	**S8**	=	1/3 $\pi^4 r^7$	(4, 7)	dddu	tetra-quarks
9	**S9**	=	32/105 $\pi^4 r^8$	(4, 8)	dddd	
10	**S10**	=	1/12 $\pi^5 r^9$	(5, 9)	ddddu	penta-quarks
11	**S11**	=	64 / 945 $\pi^5 r^{10}$	(5, 10)	ddddd	
12	**S12**	=	1 / 60 $\pi^6 r^{11}$	(6, 11)	dddddu	hexa-quarks
13	**S13**	=	128 / 10395 $\pi^6 r^{12}$	(6, 12)	dddddd	
14	**S14**	=	1 / 360 $\pi^7 r^{13}$	(7, 13)	ddddddu	hepta-quarks
15	**S15**	=	256 / 135135 $\pi^7 r^{14}$	(7, 14)	ddddddd	
16	**S16**	=	1 / 2520 $\pi^8 r^{15}$	(8, 15)	dddddddu	octa-quarks
17	**S17**	=	512 / 2027025 $\pi^8 r^{16}$	(8, 16)	dddddddd	
18	**S18**	=	1 / 20160 $\pi^9 r^{17}$	(9, 17)	ddddddddu	nona-quarks
19	**S19**	=	1024 / 34459425 $\pi^9 r^{18}$	(9, 18)	ddddddddd	
20	**S20**	=	1 / 181440 $\pi^{10} r^{19}$	(10, 19)	dddddddddu	deca-quarks
21	**S21**	=	2048 / 654729075 $\pi^{10} r^{20}$	(10, 20)	dddddddddd	

References

[1] arXiv.org:2403.01313v1 "Review of Top Quark Mass Measurements in CMS