Summary of results for $\phi = ½+\sqrt{5}/2 = 1.6180339887\ldots$

Particle Ratio	Value	Simplest Expression	Other expressions	Other expressions
Neutron-Proton	1.00137841870	$1+\frac{F_8^{3/14}}{L_4 L_{11}}$	$\frac{\phi^6 L_6^{1/2}}{F_9\sqrt{5}}$	$\frac{L_9 L_6^{1/2}}{F_6\sqrt{5}}$
Tau-Proton	1.8939	$\frac{\phi^4 F_8}{L_9}$		
Tau-Neutron	1.89129	$\frac{F_7\phi^2}{L_6}$	$\frac{F_8}{\phi^5}$	$\frac{F_6}{\phi^4}$
Helion-Proton	2.9931526671	$\frac{\phi^{13} L_3^{1/18}}{L_3 L_8}$	$\frac{L_7 F_{29}^{1/17}}{L_2 L_4}$	
Alpha-particle-Proton	3.97259968907	$\frac{\phi^{25/7} F_8^{10/21} L_2^{1/7}}{L_4}$	$\frac{\phi^{18} L_{11}^{8/15}}{L_{21}}$	$\frac{L_{11}^{8/15}}{\phi^3}$
Neutron-Muon	8.89248402	$\frac{L_5 F_5^{11/5}}{\phi^{39/5}}$		
Proton-Muon	8.88024333	$\phi^{37/30} F_5^{7/15} L_5^{7/20}$		
Tau-Muon	16.8183	$\frac{\phi^9 L_{10}^{1/11}}{L_4}$	$\frac{L_9 L_{10}^{1/11}}{L_4}$	
Muon-Electron	206.7682838	$\frac{L_2^3 L_5^{23/20}}{\phi^{3/2}}$	$F_5^{1/15} L_4^{7/15} L_5^{9/5}$	
Proton-Electron	1836.15267261	$\frac{F_{10} F_5^{3/2} L_5^{15/32}}{\phi^{1/16}}$	$L_4^{11/30} L_8^{53/30}$	
Neutron-Electron	1838.6836598	$\phi^{5/21} F_{11}^{34/21} (\frac{F_9}{2})^{1/21}$	$\frac{L_{19} L_4^{17/19}}{L_7}$	$\phi^{5/21} F_{11}^{34/21} (\frac{F_9}{2})^{1/21}$
Deuteron-Electron	3670.4829652	$L_2^3 \phi^{8/29} L_8^{36/29}$		
Helion-Electron	5495.885269	$\frac{L_9 \phi^{13}}{L_5^{14/17}}$		
Alpha particle-Electron	7294.2995363	$\frac{L_5 \phi^{17}}{L_7^{1/2}}$		

Error analysis

Particle Ratio	Value	Best Expression	Error	Relative error
Neutron-Proton	1.00137841870	$1+\frac{21^{3/14}}{L_4 L_{11}}$	0.1375×10^{-8}	2.374·e
Tau-Neutron	1.89129	$\frac{F_7 \phi^2}{L_6}$	0.48467×10^{-4}	1.573·e
Tau-Proton	1.8939	$\frac{\phi^4 F_8}{L_9}$	0.34040×10^{-5}	0.01098·e
Helion-Proton	2.9931526671	$\frac{\phi^{13} L_3^{1/18}}{L_3 L_8}$	0.36516×10^{-7}	6.2959·e
Alpha-particle-Proton	3.97259968907	$\frac{\phi^{25/7} F_8^{10/21} L_2^{1/7}}{L_4}$	0.9035×10^{-10}	0.17376·e
Proton-Muon	8.88024333	$\phi^{37/30} F_5^{7/15} L_5^{7/20}$	0.2782×10^{-7}	0.12098·e
Neutron-Muon	8.89248402	$\frac{L_5 F_5^{11/5}}{\phi^{39/5}}$	0.15001×10^{-6}	0.6522·e
Tau-Muon	16.8183	$\frac{\phi^9 L_{10}^{1/11}}{L_4}$	0.3754×10^{-7}	0.0000139·e
Muon-Electron	206.7682838	$\frac{L_2^3 L_5^{23/20}}{\phi^{3/2}}$	0.149×10^{-4}	2.764·e
Proton-Electron	1836.15267261	$\frac{F_{10} F_5^{3/2} L_5^{15/32}}{\phi^{1/16}}$	0.22071×10^{-5}	2.596·e
Neutron-Electron	1838.6836598	$\phi^{5/21} F_{11}^{34/21} (\frac{F_9}{2})^{1/21}$	0.17397×10^{-6}	0.1338·e
Deuteron-Electron	3670.4829652	$L_2^3 \phi^{8/29} L_8^{36/29}$	0.1192×10^{-5}	0.6625·e
Helion-Electron	5495.885269	$\frac{L_9 \phi^{13}}{L_5^{14/17}}$	0.2844×10^{-2}	2585·e
Alpha particle-Electron	7294.2995363	$\frac{L_5 \phi^{17}}{L_7^{1/2}}$	0.38535×10^{-3}	120·e

3 expressions are out of the range of the normal error (in gray) and have to be rejected. All the others are within the normal error, that is +/- 3e.