

PARTICLE

Particle: quark content, spin, mass, half life, decays of particles (requires MPCfont for correct display of particle names) (0.1s)	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>quarks q</div> <div> u Q=+2/3 J=1/2* m=2.2 d Q=-1/3 J=1/2* m=5 s Q=-1/3 J=1/2* m=95 c Q=+2/3 J=1/2* m=125 b Q=-1/3 J=1/2* m=420 t Q=+2/3 J=1/2* m=174 leptons l </div> </div> <div>CANCEL OK</div> </div>	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>leptons l</div> <div> e Q=-1 J=1/2 m=0.5109 μ Q=-1 J=1/2 m=105.65 τ Q=-1 J=1/2 m=1776.9 ν_e Q=0 J=1/2 m=.00000 ν_μ Q=0 J=1/2 m=.00000 ν_τ Q=0 J=1/2 m=.00000 gauge bosons </div> </div> <div>CANCEL OK</div> </div>
Particle:	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>gauge bosons</div> <div> γ Q=0 J=1- m=0 τ=∞ g(gluon) Q=0 J=1- m=0 W⁺ J=1 m=80403 Γ=2.14 W⁻ J=1 m=80403 Γ=2.14 Z⁰ J=1 m=91187.6 Γ=2. mesons qq⁻ </div> </div> <div>CANCEL OK</div> </div>	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>mesons qq⁻</div> <div> π^+=u\bar{d} J=0- m=139.57 π^-=d\bar{u} J=0- m=139.57 ρ^0=(u\bar{u}-d\bar{d})/$\sqrt{2}$ J=0- η=u\bar{u}-d\bar{d}-s\bar{s} J=0- m=54 ϕ=n(u\bar{d}...) J=1- m=775 ω=(u\bar{u}+d\bar{d})/$\sqrt{2}$+s\bar{s} J= η'=u\bar{u}-d\bar{d}-s\bar{s} J=0- m=9 </div> </div> <div>CANCEL OK</div> </div>
Particle:	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>baryons qqq</div> <div> p=uud J=1/2* m=938.27 n=udd J=1/2* m=939.56 Λ^+=uud J=1/2+... m=14 Λ^0=udd J=1/2+... Σ^{++}=uuu J=3/2* m=1232 Σ^+=uud J=3/2* Σ^0=udd J=3/2* </div> </div> <div>CANCEL OK</div> </div>	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>mesons qq⁻</div> <div> π^+=u\bar{d} J=0- m=139.57 π^-=d\bar{u} J=0- m=139.57 ρ^0=(u\bar{u}-d\bar{d})/$\sqrt{2}$ J=0- η=u\bar{u}-d\bar{d}-s\bar{s} J=0- m=54 ϕ=n(u\bar{d}...) J=1- m=775 ω=(u\bar{u}+d\bar{d})/$\sqrt{2}$+s\bar{s} J= η'=u\bar{u}-d\bar{d}-s\bar{s} J=0- m=9 </div> </div> <div>CANCEL OK</div> </div>
Particle: view u-quark	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>baryons qqq</div> <div> p=uud J=1/2* m=938.27 n=udd J=1/2* m=939.56 Λ^+=uud J=1/2+... m=14 Λ^0=udd J=1/2+... Σ^{++}=uuu J=3/2* m=1232 Σ^+=uud J=3/2* Σ^0=udd J=3/2* </div> </div> <div>CANCEL OK</div> </div>	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>mesons qq⁻</div> <div> π^+=u\bar{d} J=0- m=139.57 π^-=d\bar{u} J=0- m=139.57 ρ^0=(u\bar{u}-d\bar{d})/$\sqrt{2}$ J=0- η=u\bar{u}-d\bar{d}-s\bar{s} J=0- m=54 ϕ=n(u\bar{d}...) J=1- m=775 ω=(u\bar{u}+d\bar{d})/$\sqrt{2}$+s\bar{s} J= η'=u\bar{u}-d\bar{d}-s\bar{s} J=0- m=9 </div> </div> <div>CANCEL OK</div> </div>
properties of μ^-	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>muon</div> <div> μ^- Q=-1 J=1/2 m=105.658 τ=2.19703E-6 $\mu^- \rightarrow e^- \nu_e \bar{\nu}_\mu$ (99%) $\mu^- \rightarrow e^- \nu_e \bar{\nu}_\mu \gamma$ (1.4%) $\mu^- \rightarrow e^- \nu_e \bar{\nu}_\mu e^+ e^-$ (3.4E-5) </div> </div> <div>CANCEL OK</div> </div>	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>W boson</div> <div> W⁺ J=1 m=80403 Γ=2.141 $\rightarrow e^+ \nu_e$ (10.72%) $\rightarrow \mu^+ \nu_\mu$ (10.57%) $\rightarrow \tau^+ \nu_\tau$ (10.74%) \rightarrow hadrons (68%) $\rightarrow cs$ (31%) \rightarrow invisible (1.4%) </div> </div> <div>CANCEL OK</div> </div>
properties of W boson	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>muon</div> <div> μ^- Q=-1 J=1/2 m=105.658 τ=2.19703E-6 $\mu^- \rightarrow e^- \nu_e \bar{\nu}_\mu$ (99%) $\mu^- \rightarrow e^- \nu_e \bar{\nu}_\mu \gamma$ (1.4%) $\mu^- \rightarrow e^- \nu_e \bar{\nu}_\mu e^+ e^-$ (3.4E-5) </div> </div> <div>CANCEL OK</div> </div>	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>W boson</div> <div> W⁺ J=1 m=80403 Γ=2.141 $\rightarrow e^+ \nu_e$ (10.72%) $\rightarrow \mu^+ \nu_\mu$ (10.57%) $\rightarrow \tau^+ \nu_\tau$ (10.74%) \rightarrow hadrons (68%) $\rightarrow cs$ (31%) \rightarrow invisible (1.4%) </div> </div> <div>CANCEL OK</div> </div>
properties of K ⁺	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>K meson</div> <div> K⁺=u\bar{s} J=0 m=493.677 τ $\rightarrow \mu^+ \nu_\mu$ (63.4%) $\rightarrow \pi^0 e^+ \nu_e$ (4.9%) $\rightarrow \pi^0 \mu^+ \nu_\mu$ (3.3%) $\rightarrow \pi^+ \pi^0$ (21.1%) $\rightarrow \pi^+ \pi^0 \pi^0$ (1.7%) $\rightarrow \pi^+ \pi^+ \pi^-$ (5.6%) </div> </div> <div>CANCEL OK</div> </div>	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>Ξ^- baryon</div> <div> Ξ^-=dss J=1/2* m=1321.3 τ=1.64E-10 $\rightarrow \Lambda \pi^-$ (99.89%) $\rightarrow \Sigma^- \gamma$ (1.27E-4) $\rightarrow \Lambda e^- \nu_e$ (5.6E-4) </div> </div> <div>CANCEL OK</div> </div>
properties of Ξ^-	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>K meson</div> <div> K⁺=u\bar{s} J=0 m=493.677 τ $\rightarrow \mu^+ \nu_\mu$ (63.4%) $\rightarrow \pi^0 e^+ \nu_e$ (4.9%) $\rightarrow \pi^0 \mu^+ \nu_\mu$ (3.3%) $\rightarrow \pi^+ \pi^0$ (21.1%) $\rightarrow \pi^+ \pi^0 \pi^0$ (1.7%) $\rightarrow \pi^+ \pi^+ \pi^-$ (5.6%) </div> </div> <div>CANCEL OK</div> </div>	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>Ξ^- baryon</div> <div> Ξ^-=dss J=1/2* m=1321.3 τ=1.64E-10 $\rightarrow \Lambda \pi^-$ (99.89%) $\rightarrow \Sigma^- \gamma$ (1.27E-4) $\rightarrow \Lambda e^- \nu_e$ (5.6E-4) </div> </div> <div>CANCEL OK</div> </div>
Mesons: all mesons of particle summary table	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>mesons qq⁻</div> <div> π^+=u\bar{d} IG(JPC)=1-(0-) π^-=d\bar{u} IG(JPC)=1-(0-) ρ^0=(u\bar{u}-d\bar{d})/$\sqrt{2}$ IG(JP η=u\bar{u}-d\bar{d}-s\bar{s} IG(JPC)=0 $f_0(600)$ IG(JPC)=0+(0+) $\phi(770)$ IG(JPC)=1+(1-) $\omega(782)$ IG(JPC)=0-(1- </div> </div> <div>CANCEL OK</div> </div>	<div> <div>Particle JP H-MeV τ-s</div> <div> <div>mesons qq⁻</div> <div> π^+=u\bar{d} IG(JPC)=1-(0-) π^-=d\bar{u} IG(JPC)=1-(0-) ρ^0=(u\bar{u}-d\bar{d})/$\sqrt{2}$ IG(JP η=u\bar{u}-d\bar{d}-s\bar{s} IG(JPC)=0 $f_0(600)$ IG(JPC)=0+(0+) $\phi(770)$ IG(JPC)=1+(1-) $\omega(782)$ IG(JPC)=0-(1- </div> </div> <div>CANCEL OK</div> </div>
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Mesons: all mesons of particle summary table	<pre> Mesons qq̄ ===== bottom charm ===== Bc⁺=cb̄ I(JP)=0(0⁻) M Bc⁻=bc̄ I(JP)=0(0⁻) M ===== cc̄ ===== ηc(1S)=cc̄ I(GJP)=0⁺ J/ψ(1S)=cc̄ I(GJP)=0 χc⁰(1P)=cc̄ I(GJP)=0 χc₁(1P)=cc̄ I(GJP)=0 </pre>	<pre> Mesons qq̄ ===== bb̄ ===== Υ(1S) I(GJP)=0⁻(1⁻⁻) χb₀(1P) I(GJP)=0⁺(0⁺) χb₁(1P) I(GJP)=0⁺(1⁺) χb₂(1P) I(GJP)=0⁺(2⁺) Υ(2S) I(GJP)=0⁻(1⁻⁻) Υ(4S) I(GJP)=0⁻(2⁻⁻) χb₀(2P) I(GJP)=0⁺(0⁺) </pre>
[OK] gives properties	<pre> D⁺=cd̄ I(JP)=1/2(0⁻) M=1869.57 τ=1.04E-12 K⁻→π⁺νs(8.83%) K⁻→0π⁺νp(3.2%) K⁻→π⁺π⁺νs(3.5%) K⁻→*(282)π⁺π⁺νs(3.68%) K⁻→π⁺π⁺νs(3.2%) K⁻→0π⁺νp(5.5%) K⁻S0π⁺(1.5%) K⁻L0π⁺(1.5%) K⁻→π⁺π⁺(9.13%) K⁻→0π⁺(1.3%) </pre>	<pre> J/ψ(1S)=cc̄ I(GJP)=0⁻(1⁻⁻) M=3096.92 Γ=0.093 +hadrons(87.7) +π⁺π⁻(5.94%) +μ⁺μ⁻(5.93%) +π(1.69%) +Δ(1232)π(1.09%) +Σ(π⁺π⁻)π⁰(5.5%) +Σ(π⁺π⁻)π⁰(2.9%) +π⁺π⁻π⁰(2.07%) +π⁺π⁻π⁰K⁺K⁻(1.94%) +Σ(π⁺π⁻π⁰)(1.61%) </pre>
Baryons: all baryons of particle summary table	<pre> Baryons qqq ===== n baryons ===== p=uud I(JP)=1/2(1/2⁺) n=udd I(JP)=1/2(1/2⁺) Λ(1440)P₁₁ I(JP)=1/2(Λ(1520)D₁₃ I(JP)=1/2(Λ(1535)S₁₁ I(JP)=1/2(Λ(1650)S₁₁ I(JP)=1/2(Λ(1675)S₁₁ I(JP)=1/2(</pre>	<pre> Baryons qqq ===== Δ baryons ===== Δ(1232)P₃₃ I(JP)=3/2(Δ(1600)P₃₃ I(JP)=3/2(Δ(1620)S₃₁ I(JP)=3/2(Δ(1700)D₃₃ I(JP)=3/2(Δ(1905)F₃₃ I(JP)=3/2(Δ(1910)P₃₁ I(JP)=3/2(Δ(1920)F₃₃ I(JP)=3/2(</pre>
Baryons: all baryons of particle summary table	<pre> Baryons qqq ===== Λ baryons ===== Λ=uds I(JP)=0(1/2⁺) M Λ(1405)S₀₁ I(JP)=0(1/ Λ(1520)D₀₃ I(JP)=0(3/ Λ(1600)F₀₁ I(JP)=0(1/ Λ(1670)S₀₁ I(JP)=0(1/ Λ(1690)D₀₃ I(JP)=0(3/ Λ(1800)S₀₁ I(JP)=0(1/ </pre>	<pre> Baryons qqq ===== Σ baryons ===== Σ⁺=uus I(JP)=1(1/2⁺) Σ⁰=uds I(JP)=1(1/2⁺) Σ⁻=dds I(JP)=1(1/2⁺) Σ(1385)F₁₃ I(JP)=1(3/ Σ(1660)F₁₁ I(JP)=1(1/ Σ(1670)D₁₃ I(JP)=1(3/ Σ(1750)S₁₁ I(JP)=1(1/ </pre>
Baryons: all baryons of particle summary table	<pre> Baryons qqq ===== Ξ baryons ===== Ξ⁰=uss I(JP)=1/2(1/2⁺) Ξ⁻=dss I(JP)=1/2(1/2⁺) Ξ(1530)F₁₃ I(JP)=1/2(Ξ(1690) I(JP)=1/2(?) Ξ(1820)D₁₃ I(JP)=1/2(Ξ(1950) I(JP)=1/2(?) Ξ(2030) I(JP)=1/2(25/ </pre>	<pre> Baryons qqq ===== Ω baryons ===== Ω⁻=sss I(JP)=0(3/2⁺) Ω(2250)⁻ I(JP)=0(?) ===== charmed baryons ===== Λc⁺=udc I(JP)=0(1/2⁺) Λc(2595)⁺ I(JP)=0(1/2 Λc(2625)⁺ I(JP)=0(3/2 Λc(2880)⁺ I(JP)=0(5/2 Λc(2940)⁺ I(JP)=0(?) Σc(2455) I(JP)=1(1/2⁺) Σc(2520) I(JP)=1(3/2⁺) </pre>
Baryons: all baryons of particle summary table	<pre> Baryons qqq ===== charmed baryons ===== Λc⁺=udc I(JP)=0(1/2⁺) Λc(2595)⁺ I(JP)=0(1/2 Λc(2625)⁺ I(JP)=0(3/2 Λc(2880)⁺ I(JP)=0(5/2 Λc(2940)⁺ I(JP)=0(?) Σc(2455) I(JP)=1(1/2⁺) Σc(2520) I(JP)=1(3/2⁺) </pre>	<pre> Baryons qqq ===== bottom baryons ===== Λb(2770)⁰ I(JP)=0(3/2 Λb⁰=udb I(JP)=0(1/2⁺) Σb=uub,ddb I(JP)=1(1/ Σb⁰=uub,ddb I(JP)=1(3 Σb⁰=usb I(JP)=1/2(1/2 Σb⁻=dsb I(JP)=1/2(1/2 Ωb⁻=ssb I(JP)=0(1/2⁺) </pre>
[OK] shows info and puts copy to stack	<pre> ?===== charmed baryons ===== C=+1 Λc⁺=udc, Ec⁺=uuc, Ec⁺=udc, Ec⁰=ddc, Ec⁰=usc, Ec⁰=dsc, Ec⁰=ssc </pre>	<pre> Σ⁺=uus I(JP)=1(1/2⁺) m τ=0.8E-10 →pπ⁰(51.57%) →nπ⁺(48.31%) →pγ(1.28E-3) →nπ⁺γ(4.5E-4) →Λe⁺νs(2E-5) →pμ⁺μ⁻(9E-8) </pre>
Amplitudes (0.1s)	<pre> Amplitudes ===== massless 3pt ===== 'A(1/2,-1/2,0)=H*(I31 'A(1,-1,0)=H*(I31)*2/ 'A(0,0,-1)=g*(I23)*I31 'A(0,0,1)=g*(I23)*I31 'A(-1/2,1/2,-1)=g*Txx 'A(-1/2,1/2,1)=g*Txx 'A(1,1,-1)=g*Fxx*(I1 </pre>	<pre> Amplitudes ===== massive 3 pt ===== 'A(0,0,0)=g*H' 'A(1/2,1/2,0)=g*(I2) 'A(1,1,0)=g*(I2)*I31 'A(1/2,1/2,1)=g*(I2)*I31 'A(1,1,1)=g*(H*H')*(I1 ===== mixed 3pt ===== 'A(E,x,γ)=g*(I2)*gxx </pre>

Info massless 3 pt amps	<div>Amplitudes</div> <div><div>Massless 3pt</div><div><pre>'A(1/2,-1/2,0)=H*(I31 'A(1,-1,0)=H*(I31)*2/ 'A(0,0,-1)=g*(<23>)*<3 'A(0,0,1)=g*(I23)*I31 'A(-1/2,1/2,-1)=g*Ta* 'A(-1/2,1/2,1)=g*Ta*('A(1,1,-1)=g*fabc*(I1</pre></div></div> <div>CANCL OK</div>	<div>Massless 3pt</div> <div><pre>'A(i,j,k)=g*pi(i,j)*^((s*(h-2*hk)))' product over cyclic perms of i,j,k h=h_i+h_j+h_k total helicity s=SIGN(h) sign of total helicity s+=(h>0),s-=(h<0),s+=(h=0) (i,j)*^=(i,j)*(s=-),i,j,l(s=+) Fermion(q,l) h_i=+-1/2 scalar(H) h_i=0 gauge boson(g,g) h_i=+-1 graviton h_i=+-2 fa,fabc=color factors</pre></div> <div>+SHIP SHIP+ +DEL DEL+ DEL L INS =</div>																																																		
Info massive 3 pt amps	<div>Massive 3 pt</div> <div><pre>'A(i,j,k)=g*ET(i,j)*^((s-2*s_k))' Massive amps for s=2-Max(s_i)>0 sum of products with various s all particles Massive l,j)=l,j) massive spinor s=s_i+s_j+s_k total spin (i,j)*^=(i,j)*(s=-),i,j,l(s=+) Fermion(q,l) s_i=1/2 scalar(H) s_i=0 gauge boson(V=W,Z) s_i=1</pre></div> <div>+SHIP SHIP+ +DEL DEL+ DEL L INS =</div>	<div>Mixed 3pt</div> <div><pre>particle 1,2 Massive l,j)=l,j) particle 3 Massless x-factor: (s+,-) 'x'=(c-1/3)/((H*(c3)-s)) 'x'=(I2/H)*E_p*1 s=polarisation 's'=(I2*(I3)*((c-1/3)-(3c)-s)) (i,j)*^=(i,j)*(s=-),i,j,l(s=+)</pre></div> <div>Fermion x, scalar y photon y, gluon g, graviton h Massive Weak boson W(H,Z)</div> <div>+SHIP SHIP+ +DEL DEL+ DEL L INS =</div>																																																		
Info mixed 3 pt amps																																																				
Amplitudes	<div>0:</div> <div>1:</div> <div>2:</div> <div>3:</div> <div>4:</div> <div>5:</div> <div>6:</div> <div><pre>A(E,x,g^2)=g*Ta*(12)-x^0 A(E,x,y^2)=g*(12)-x^0 A(E,x,h^2)=H/HP*(12)-x^0</pre></div> <div>Parti Meson Baryo Ampli VIEW FundP</div>	<div>0:</div> <div>1:</div> <div>2:</div> <div>3:</div> <div>4:</div> <div>5:</div> <div>6:</div> <div><pre>A(1/2,1/2,0)=3*(12)* A(1,1,0)=2/H*(12)*^((12))* A(1/2,1/2,1)=2/H*(13)*^((23))* A(1,1,1)=3/H*H*(12)*^((23))*^((31))*</pre></div> <div>Parti Meson Baryo Ampli VIEW FundP</div>																																																		
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Diagrams: fundamental diagrams (0.1s)	<div>Feynman diagrams</div> <div><div>el.honn: Graphic 131 *</div><div>weak: Graphic 131 * 80</div><div>strong: Graphic 131 *</div></div> <div>CANCL OK</div>	<div></div> <div>(8,Y)</div> <div>EDIT CANCL</div>																																																		
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Pmass: running particle masses	<pre> GeV Hq1 H2(91.2) Ht(172.5) 10³ Hu ? .000127 .000122 .0011 Hd ? .00029 .000276 .0025 Hs ? .055 .052 .047 Hc 1.77 .619 .59 .532 Hb 4.91 2.29 2.75 2.43 Ht 172.5 171.7 162.9 150.7 </pre>
CKM matrix	<pre> TEXT OK 3: [Vud Vus Vub] [Vcd Vcs Vcb] [Vtd Vts Vtb] 2: [c12-c13 -s12-c23-c12-s23-s13-e^{i%} c12-t s12-s23-c12-c23-s13-e^{i%} -c12-t 1: [.97428 .2253 .00347] [.2252 .97345 .041] [.00862 .0403 .999152] VCKM UMaX3 Phass HelpP PARTL MESLI </pre>
Neutrinomixing parameters	<pre> 4: 3: 2: 1: { SIN(2*theta12)=.861 Delta21²= .0000759_eV² SIN(2*theta23)=.92 Delta32²= .00243_eV² SIN(2*theta13)<.15 VCKM UMaX3 Phass HelpP PARTL MESLI </pre>
UPMNS matrix	<pre> 4: 3: [Ue1 Ue2 Ue3] [Up1 Up2 Up3] [Ut1 Ut2 Ut3] 2: [c12-c13 -s12-c23-c12-s23-s13-e^{i%cp} ct s12-s23-c12-c23-s13-e^{i%cp} -ct 1: { SIN(theta12)=.307 Delta21²=.000075t Diagr VCKM UPMNS Phass PARTL MESLI </pre>
Neutrinomixing parameters	<pre> 4: 3: 2: 1: { SIN(2*theta12)=.861 Delta21²=.0000759_eV² SIN(2*theta23)=.92 Delta32²=.00243_eV² SIN(2*theta13)<.15 VCKM UMaX3 Phass HelpP PARTL MESLI </pre>
HelpPARTICLE: help	<pre> PARTICLE: quarks, leptons, gauge bosons, mesons, baryons Particles _ + choosebox with particle data. View and copy to stack with [OH]. [SPC]: jump to next group Mesons _ + choosebox with meson data Baryons _ + choosebox with baryon data +SKIP SKIP+ +DEL DEL+ DEL L INS= </pre>
HelpPARTICLE: help	<pre> UPMNS _ + UPMNS Pontecorvo Maki Nagakawa Sakata Matrix for neutrino mixing Phass _ + [] Matrix with running quark lepton masses at Hq1,H2(91.2),Ht(172.5), 1E3,1E9,1E12,2E16_GeV arXiv: hep-ph/0712.1419.v3 PARTLIST _ + {} particle data MESLIST _ + {} meson data BARYLIST _ + {} baryon data +SKIP SKIP+ +DEL DEL+ DEL L INS= </pre>
HelpPARTICLE: help	<pre> UPMNS _ + UPMNS Pontecorvo Maki Nagakawa Sakata Matrix for neutrino mixing Phass _ + [] Matrix with running quark lepton masses at Hq1,H2(91.2),Ht(172.5), 1E3,1E9,1E12,2E16_GeV arXiv: hep-ph/0712.1419.v3 PARTLIST _ + {} particle data MESLIST _ + {} meson data BARYLIST _ + {} baryon data +SKIP SKIP+ +DEL DEL+ DEL L INS= </pre>