The masses of baryons in a cold genesis theory

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Abstract

The masses of the baryons in the author's cold genesis theory of fields and particles are presented in a comparative table.

Table 1. *Elementary particles: (theoretic mass-CGT)/(experimentally determined mass).*

Basic quarks: $m_1 = (z_2 - m_e^*) = 135.2\ m_e$, $m_2^- = m_1^+ + e^- + \sigma_e\ (e^{+*} + e^{-*}) = 137{,}8\ m_e$; $\rightarrow m_1 + e^+ + \nu_e$;

Derived quarks: $p^+\ (n^-) = m_1\ (m_2) + 2z_\pi$; p; n) $\approx 611.2 m_e$; $613.8 m_e$; $\lambda^\pm = p^+(n^-) + z_\pi$; $\lambda^- = 851.8\ m_e$

($n^- = p^+ + e^- + \sigma_e \rightarrow p^+ + e^- + \bar{\nu}_e$; $s^\pm = \lambda^\pm + z_2$; $s^- = 987.8 m_e$; $v^\pm = \lambda^\pm + 2z_2$; $v^- = 1123.8\ m_e$

Mesons: $(q - \bar{q})$

Baryons: $(q\text{-}q\text{-}q)$; $(q^+ \equiv q(+^2/_3 e)\ ;\ q^- \equiv q(-^1/_3 e))$

$\mu^\pm = 2z_1 + e^\pm = 205\ m_e$; / $\mu^+ = 206.7\ m_e$;

$(z_1 = 3z^0\ ;\ z_2 = 4z^0\ ;\ z_\pi = 7z^0)$

$\pi^o = m_1 + \bar{m}_1 = 270.4 m_e$; / $\pi^0 = 264.2\ m_e$

$\pi^+ = m_1 + \bar{m}_2 = 273\ m_e$; / $\pi^+ = 273.2\ m_e$

$\pi^\pm \rightarrow \mu^\pm + \nu_\mu\ (2z_0)$

$K^+ = m_1 + \bar{\lambda} = 987\ m_e$; / $K^+ = 966.3\ m_e$

$K^o = m_2 + \bar{\lambda} = 989.6\ m_e$; / $K^o = 974.5\ m_e$

$\eta^o = m_2 + \bar{s} = 1125.6\ m_e$; / $\eta^0 = 1073\ m_e$

$\phi^0 = \lambda + \bar{v} = 1975.6\ m_e$; / $\phi^0 = 1995\ m_e$

$\theta^- = v + s + \lambda = 2963.4\ m_e$;

/exp. $\theta \approx 2978 \pm 6 m_e$

$-p_r = 2p + n = 1836.2 m_e$; $n_e = 2n + p = 1838.8 m_e$;

/ exp. : p_r^+, $= 1836.1\ m_e$; $n_e = 1838.7 m_e$;

$-\Lambda^o = s^- + n + p = 2212.8\ m_e$; / $\Lambda^0 = 2182.7\ m_e$

$-\Delta^{(++;+;0;-)} = s^\pm + \lambda^\pm + p^+(n^-) = 2445.6$; $2453.4\ m_e$;

/exp: $\Delta^{\pm;0} = 2411 \pm 4\ m_e$

$-\Sigma^+ = v^- + 2p = 2346.2 m_e$; $\Sigma^- = v^- + 2n = 2351.4 m_e$;

/exp.: $\Sigma^+ = 2327\ m_e$; $\Sigma^- = 2342.6\ m_e$

$-\Sigma^o = v^- + n + p = 2348.8\ m_e$ / exp. $\Sigma^0 = 2333\ m_e$;

$-\Xi^o = 2s^- + p = 2586.8\ m_e$; $\Xi^- = 2s^- + n = 2589.4\ m_e$;

/exp.: $\Xi^0 = 2572$; $\Xi^- = 2587.7\ m_e$;

$-\Omega^- = 3v^- = 3371.4\ m_e$; predict.: $\Omega^{++} = 3v^+ = 3363.6\ m_e$

/ exp.: $\Omega^- = 3273\ m_e$; $N_0^{3*} \approx 3366\ m_e$;

The masses of some "resonance" particles (*) may result also in the variant of "cold" forming, in the form:

$\Delta^{o*} = 2v^- + p = 2858.8\ m_e$; $\Delta^{-*} = 2v^- + n = 2861.4\ m_e$; (known mass of baryon "resonance": 2850 m_e),

and: $\Xi^{-*} = 3s^- = 2963.4\ m_e$; (known mass of baryon "resonance": 3004 m_e).

Table 2: Compound heavy quarks (theoretical masses)

q^c (compound)	q_2	q_2^* (CGT)	q_3	q_3'	q_3^* (CGT)	$q_3'^*$ (CGT)	q_4 (CGT)	$q_5 = (t;h)$
$q_1 = (s\ ;\ v)$	$c^\bullet(s\cdot\bar{s}\cdot v\text{-}z_0)$	$c^*(s\cdot\bar{s}\cdot v)$	$b^\bullet(c^\bullet\ \bar{c}^\bullet\cdot c\text{-}z_2)$	$b(c\ \bar{c}\cdot c\text{-}z_3)$	$b^\bullet(c^\bullet\ \bar{c}^\bullet\cdot c)$	$b^c(c^*\ \bar{c}^*\cdot c^*)$	$f(b\ \bar{b}b)$	$t(7x5)b$
$q_2' = q^s$	$c(v\ \bar{v}v\text{-}z_0)^s$	$c^*(v\cdot\bar{v}\cdot v)$	$b^\wedge(c\ \bar{c}\cdot c^\bullet\text{-}\ z_2)$		$b^\wedge(c\ \bar{c}\cdot c^\bullet)$	$b^{c'}(c^*\ \bar{c}^*\cdot c^*)$	$f(b^\bullet\ \bar{b}^\bullet b^\bullet)$	$t(7x5)b^\bullet$
$^\wedge$ - new	$c^\wedge(v\ \bar{v}s\text{-}z_0)$	$c^\wedge(v\cdot\bar{v}\cdot s)$	$b^\wedge(c^\bullet\ \bar{c}^\bullet c^\bullet\text{-}z_2)$		$b^\wedge(c^\bullet\ \bar{c}^\bullet c^\bullet)$	$b^c(c^*\ \bar{c}^*\cdot c^\wedge)$	$f(b\ \bar{b}b^\bullet)$	$t(7x5)b^*$
	$c^\wedge(s\ \bar{s}\cdot s\text{-}z_0)$	$c^\wedge(s\cdot\bar{s}\cdot s)$			$b(c\ \bar{c}\cdot c)$	$b^{c'}(c^\wedge\ \bar{c}^\wedge\cdot c^*)$	$f(b^\bullet\ \bar{b}^\bullet b)$	$h(7x5)c$
$m(GeV/c^2)$	1.557 (SM) 1.7 1.631 1.483	1.574 1.718^+ $(1.722)^-$ 1.648 1.5	4.744 (SM) 4.887 4.601	5 $(b = b^s)$	4.814 4.957 4.671 5.1	4.722 5.154;5.166 4.648;5.084 5.014; 4.718	15 14.232 14.744 14.488 14.774	175 166 180.4 177.9 59.5
z_k(emitted)	$\delta_1 = z_0$		$\delta_2 = z_2$	$\delta_2' = z_3$			$\delta_3(z_4;\ z_5)$	?

Annex 1: Table 3: *The theoretic masses of cold baryons and of de-excited ("hot" formed) baryons, (CGT)*

Baryons experimental mass (GeV), (16) (rest mass); J^p ½	Theor. mass, (Souza): u; d (0.31GeV); s(0.5); c (1.7); b (5GeV)	Theoretic mass, (cold baryon,CGT)* p^*;n^*(~0.312;); λ^{-*}(0.435); s^{-*}(~0.5); v^-(0.574); c^{*+}(1.718); b^{*-}(5.166)	Observations ( )^d -de-excited state(GeV) + predicted baryons-
N (0.938÷0.939) ; (udd)	~0.939	~0.939; (ppn); (pnn)	(') = "prime charmed"
$-\Delta^{(++;+;0;-)}$ (1.232)	1.24 (n+m+k=1)	~1.25; $(s^{\pm} + \lambda^{\pm} + p^+(n^-))^*$	≈ 0.31x4 =4u (compound)
$-\Lambda^0$ (1.116) (uds)	1.12 (n+m+k=0)	~1.13; (n + p + s)*	$-(1.13)^d$
$-\Sigma^+$; Σ^- ; Σ^0 (1.189; 1192; 1.197) (uus; uds ; dds)	1.12 (n+m+k=0)	~1.199 ; ~1.2; $(v+2p)^*$; $(v+p+n)^*$; $(v+2n)^*$	discrepancy at Souza:6.3% -discrep. at CGT: 0.25%
$-\Xi^0$(1.314); Ξ^-(1.321) (u;d)ss	1.31 (n+m+k=0)	~1.321; 1.323; $(2s+p)^*$;$(2s+n)^*$	$-(1.32)^d$; $(2s+\lambda) = 1.44$
$-\Omega^-$ (1.673) (sss); J^p 3/2	1.5 (n+m+k=0) (sss)	1.722 $(3v)^*$; 1.653 $(2v+s)^*$	$-(3v)^d$=1.7; (2v+s)=1.653
θ^- (1.521) ; $\Xi^-_{res.}$ (1.535)(dss)	1.5 (n+m+k=0)	1.514 (v + s + λ)* ; $(sss)^* = 1.51$	$-(1.51)^d$; $(v+2s)^d = 1.583$
$-\Lambda_c^+$ (2.286) (udc)	2.32 ; (n+m+k=0)	2.343 $(pnc)^* = (pnc^*)$	$-(2.325)^d$; $(m_c^* = 3m_v^*)$
$-\Lambda_b^+$ (5.619) (udb)	5.62 ; (n+m+k=0)	5.791 $(pnb)^* = (pnb^*)$	$-(5.625)^d$; $(m_b^* = 3m_c^*)$
$-\Sigma_c^{++}$(2.454) (uuc)	2.63 (n=1; m+k=0)	2.465 $(p\lambda^+c)^*$; $(ppc)^* = 2.342$	$-(2.447)^d$; -discrep. 0.3%
$-\Sigma_c^+$(2.4529) (udc)	2.63 (n=1; m+k=0)	2.466 $(p\lambda^-c)^*$; $(pnc)^* = 2.343$	$(2.448)^d$; $(psc)^d = 2.5$;
$-\Sigma_c^0$(2.4537) (ddc)	2.63 (n=1; m+k=0)	2.467 $(n\lambda^-c)^*$; $(nnc)^* = 2.344$	$(2.449)^d$; -discrep. 0.3%
$-\Sigma_b^+$(5.811) (uub)	5.62 (uub); (n,m,k) =0	5.79 $(ppb)^*$; 5.913 $(p\lambda^+b)^*$	$(ps^+b)^d$ ≈5.812; -dis. 0.05%
$-\Sigma_b^0$(unknown) (udb)	5.62 (udb); 5.81 (usb)	5.791$(pnb)^*$; 5.914 $(p\lambda^-b)^*$; $(ps^-b)^*$	$(psb)^d$=5.813; $(pnb)^d$=5.62
$-\Sigma_b^-$(5.815) (ddb)	5.62 (ddb); 5.81 (dsb)	5.792$(nnb)^*$; 5.915$(n\lambda^-b)^*$;5.98$(nsb)^*$	$(ns^-b)^d$=5.814; -dis. 0.12%
$-\Xi_c^+$ (2.467); (usc)	2.51 (n+m+k = 0)	2.526 $(psc)^*$	$(2.512)^d$; -discrep. 1.8%
$-\Xi_c^0$ (2.47) (dsc)	2.51 ----"-------	2.527 $(nsc)^*$	$(2.513)^d$; -discrep. 1.7%
$-\Xi_c^{'+}$ (2.575); (usc)	2.51 ----"-------	2.604 $(pvc)^*$	$(2.586)^d$; -discrep. 0.4%
$\Xi_c^{'0}$ (2.578) (dsc)	2.51 ----"-------	2.605 $(nvc)^*$	$(2.587)^d$; - discrep. 0.35%
$-\Xi_{cc}^{++}$ (3.621); (ucc)	3.71 ----"-------	3.748 $(pcc)^*$	$(3.712)^d$; -discrep. 2.5%
Ξ_{cc}^+ (unknown) (dcc)	3.71 ----"-------	3.749 $(ncc)^*$	$(3.713)^d$
Ξ_b^0 (5.788) (usb)	5.81 ----"-------	$(psb)^* = 5.978$;	$(5.812)^d$; $(pvb)^d = 5.886$
Ξ_b^- (5.791) (dsb)	5.81 ----"-------	$(nsb)^* = 5.979$; ;	$(5.813)^d$; $(nnb)^d \approx 5.62$
$\Xi_b^{'0}$ (unknown) (usb)	5.81 ----"-------	5.913 $(p\lambda b)^*$; $(pvb)^* = 6.052$	$(5.747)^d$; $pvb)^d = 5.886$
$\Xi_b^{'-}$(unknown) (dsb)	5.81 ----"-------	5.914 $(n\lambda b)^*$; $(nvb)^* = 6.053$	$(5.748)^d$; $nvb)^d = 5.887$
Ξ_{bb}^0 (unknown) (ubb)	10.31 ----"-------	10.644 $(pbb)^*$	$(10.312)^d$
Ξ_{bb}^- (unknown) (dbb)	10.31 ----"-------	10.645 $(nbb)^*$	$(10.312)^d$
Ξ_{cb}^+ (unknown) (ucb)	7.01 ----"-------	7.196 $(pcb)^*$	$(7.012)^d$
Ξ_{cb}^0 (unknown) (dcb)	7.01 ----"-------	7.197 $(ncb)^*$	$(7.013)^d$
$\Xi_{cb}^{'+}$ (unknown) (ucb)	7.01 ----"-------	7.317 $(\lambda^+cb)^*$	$(7.135)^d$
$\Xi_{cb}^{'0}$ (unknown) (dcb)	7.01 ----"-------	7.319 $(\lambda^-cb)^*$	$(7.135)^d$
$-\Omega_c^0$ (2.695) (ssc)	2.7 ----"-------	2.718 $(ssc)^*$; $(\lambda sc)^* = 2.653$	$(2.7)^d$; $(\lambda\lambda c)^d = 2.57$
$-\Omega_b^-$ (6.071) (ssb)	6 ----"-------	$(ssb)^* = 6.166$; $(\lambda sb)^* = 6.101$	$(\approx 6)^d$; $(\lambda\lambda b)^d = 5.87$
$-\Omega_{cc}^+$ (unknown) (scc)	3.9 ----"-------	3.936 $(scc)^*$; $(vcc)^* = 3.982$	$(3.9)^d$; $(\lambda cc)^d = 3.44$
$-\Omega_{cb}^0$ (unknown) (scb)	7.2 ----"-------	7.384 $(scb)^*$	$(7.2)^d$;
$-\Omega_{cb}^{'0}$ (unknown) (scb)	7.2 ----"-------	7.458 $(vcb)^*$	$(7.247)^d$
$-\Omega_{bb}^-$ (unknown) (sbb)	10.5 ----"-------	10.832 $(sbb)^*$; $(vbb)^* = 10.906$	$(10.5)^d$; $(vbb)^d = 10.574$
$-\Omega_{ccb}^+$ (unknown) (ccb)	8.4 ----"-------	8.602 $(ccb)^*$	$(8.4)^d$
$-\Omega_{cbb}^0$ (unknown) (cbb)	11.7 ----"-------	12.046 $(cbb)^*$	$(11.7)^d$
$-\theta_c^0$ (unknown)		2.653 $(\lambda sc^+)^*$; $(\lambda vc^+)^* = 2.727$;	$(2.635)^d$; $(\lambda vc)^d \approx 2.7$
$-\theta_c^-$ (unknown)		2.657 $(\lambda sc^-)^*$; $(\lambda vc^-)^* = 2.73$; $(svc)^*$	$(2.635)^d$; $(2.71)^d$; $(3.274)^d$
-θb- (unknown)		6.175 (λvb)* ; $(svb)^* = 6.24$	$(6.009)^d$; $(svb)^d = 6.074$
? ; ? (unknown)		$(vvc)^* = 2.866$; $(vvb)^* = 6.314$	$(vvc)^d$=2.85; $(vvb)^d = 6.15$

Annex 2: Table 4: *The theoretic masses of cold baryons and of de-excited ("hot" formed) baryons, (CGT)*

Baryons experimental mass (MeV), (14) (rest mass); $J^p\,^3/_2$	Theor. mass, (cold baryon, CGT)*: p^*;n^*(~0.312;); λ^{-*}(0.435); s^{-*}(~0.5); v^-(0.574); c^{*+}(1.718); b^{*+}(5.154) ; b^{*-}(5.166) ; (GeV)	Theor. mass, , GeV (de-excited quarks)$'$: λ^-(0.435) u; d = p; n (0.312); s(0.5); v^-(0.574); c (1.7); b (5)	Theoretic mass (GeV) $(\,)^d$-de-excited baryon + predicted baryons- $z_1(3z^0); z_2(4z^0); z_3(6z^0)$;
$\Sigma*^-$ (1385) dds	$(v + s + p)^* = 1.390$	$(v + s + p)' = 1.390$	
$\Sigma*^{++}_c$ (2518) uuc	$(p + s^+ + c) = 2.529$	$(p + s^+ + c)' = 2.511$	
$\Sigma*^{+}_c$ (2517.5) udc	$(p + s^- + c) = 2.530$	$(p + s^- + c)' = 2.512$	
$\Sigma*^{0}_c$ (2518.8) ddc	$(n + s^- + c) = 2.531$	$(n + s^- + c)' = 2.513$	
$\Sigma*^{+}_b$ (5832.1) uub	$(p\ v\ b^+)^* = 6.04$	$(p\ v\ b)' = 5.886$	$(p\ v\ b)' - z_1 = 5.834$
$\Sigma*^{0}_b$ unknown udb	$(n\ v\ b^+)^* = 6.041$	$(n\ v\ b^+)' = 5.887$	$(n\ v\ b^+)' - z_1 = 5.835$
$\Sigma*^{-}_b$ (5835.1) ddb	$(n\ v\ b^-)^* = 6.053$	$(n\ v\ b^-)' = 5.899$	$(n\ v\ b^-)' - z_1 = 5.847$
$\Xi*^0$ (1531.8) uus	$(\lambda^+\ v\ v) = 1.583$	$(\lambda^+\ v\ v)' = 1.583$	$(\lambda^+\ v\ v)' - z_1 = 1.531$
$\Xi*^-$ (1535) uds	$(\lambda^-\ v\ v) = 1.584$	$(\lambda^-\ v\ v)' = 1.584$	$(\lambda^-\ v\ v)' - z_1 = 1.532$
$\Xi*^{+}_c$(2645.9) ; usc $\Xi*^{0}_c$(2645.9) ; dsc	$(\lambda^+ + s^- + c)^* = 2.653$ $(\lambda^- + s^- + c)^* = 2.654$	$(\lambda^+ + s^- + c)' = 2.635$ $(\lambda^- + s^- + c)' = 2.636$	
$\Xi*^{+}_{cc}$ (unknown) dcc $\Xi*^{++}_{cc}$ (unknown) ucc	$(\lambda^- + c^* + c^*)^* = 3.871$ $(\lambda^+ + c^* + c^*)^* = 3.870$	$(\lambda^- + c + c)' = 3.835$ $(\lambda^+ + c + c)' = 3.834$	
$\Xi*^{0}_b$ (5945.5) usb	$(\lambda^- + s^- + b^+)^* = 6.089$	$(\lambda^- + s^- + b^+)' = 5.935$	
$\Xi*^{-}_b$ (unknown) dsb	$(\lambda^- + s^- + b^-)^* = 6.101$	$(\lambda^- + s^- + b^-)' = 5.947$	
$\Xi*^{0}_{bb}$ (unknown) ubb	$(\lambda^+ + b^- + b^-)^* = 10.767$	$(\lambda^+ + b^- + b^-)' = 10.458$	
$\Xi*^{-}_{bb}$ (unknown) dbb	$(\lambda^- + b^- + b^-)^* = 10.768$	$(\lambda^- + b^- + b^-)' = 10.459$	
$\Xi*^{+}_{cb}$ (unknown) ucb	$(\lambda^- + b^+ + b^+)^* = 10.744$	$(\lambda^- + b^+ + b^+)' = 10.435$	
$\Xi*^{0}_{cb}$ (unknown) dcb	$(\lambda^- + b^- + b^+)^* = 10.756$	$(\lambda^- + b^- + b^+)' = 10.447$	
Ω^-(1672.45) sss	$(v^-\ v^-\ v^-)^* = 1.722$	$(v^-\ v^-\ v^-)' = 1.722$	$(v^-\ v^-\ v^-)' - z^0 = 1.705$ $(v^-\ v^-\ v^-)' - z_1 = 1.670$
$\Omega*^{0}_c$ (2766) ssc	$(v^- + s^- + c)^* = 2.792$	$(v^- + s^- + c)' = 2.774$	discr. 0.3%
$\Omega*^{-}_b$ (unknown) ssb	$(v^- + s^- + b^-)^* = 6.24$	$(v^- + s^- + b^-)' = 6.074$	
$\Omega*^{+}_{cc}$ (unknown) scc	$(v^- + c^+ + c^+)^* = 4.01$	$(v^- + c^+ + c^+)' = 3.974$	
$\Omega*^{0}_{cb}$ (unknown) scb	$(v^- + c^+ + b^-)^* = 7.458$	$(v^- + c^+ + b^-)' = 7.274$	
$\Omega*^{-}_{bb}$ (unknown) sbb	$(v^- + b^- + b^-)^* = 10.906$	$(v^- + b^- + b^-)' = 10.574$	
Ω^{++}_{ccc} (unknown) ccc	$(c^+ + c^+ + c^+)^* = 5.154$	$(c^+ + c^+ + c^+)' = 5.1$ $(c^{+\bullet} + c^{+\bullet} + c^{+\bullet})' = 4.67$	$(c^+\ c^+\ c^+)' - z_3 = 5.0$ $(c^{+\bullet} c^{+\bullet} c^{+\bullet})' - z_2 = 4.6$
$\Omega*^{+}_{ccb}$ (unknown) ccb	$(c^+ + c^+ + b^-)^* = 8.602$	$(c^+ + c^+ + b^-)' = 8.4$ $(c^{+\bullet} + c^{+\bullet} + b^{-\bullet})' = 7.854$	
$\Omega*^{0}_{cbb}$ (unknown) cbb	$(c^+ + b^- + b^-)^* = 12.05$	$(c^+ + b^- + b^-)' = 11.7$	
$\Omega*^{0}_{bbb}$ (unknown) bbb	$(b^+ + b^- + b^-)^* = 15.486$	$(b^+ + b^- + b^-)' \approx 15.0$	$m(\Omega*^{0}_{cbb}) \approx m(f^{\pm})$

Annex 3: Table 5: *The theoretic masses of heavy pseudo-scalar mesons , conform to CGT*

Heavy mesons (MeV/c^2) -experimental mass-	**Theoretic mass,** (cold meson, CGT)*, MeV/c^2	**Theoretic mass,** (de-excited meson, CGT)^d, MeV/c^2	**Observations + predictions**
η' (957.6) $^1/_3(u\bar{u}+d\bar{d}+s\bar{s})$	$\eta'(\lambda + \bar{s}) = 935$	$(935)^d$	$\eta''(s + \bar{s}) = 1000$
η_c (2980.3) $(c\bar{c})$	$3436(c^*\bar{c}^*)^*$; $3100\ (c^\bullet\bar{c}^\bullet)^*$	$3030.5\ (c^\bullet\bar{c}^\bullet)^d = (c^\bullet\bar{c}^\bullet) - z_2$	$[(c\bar{c}) - z_2] = 3330.5$
η_b (9300) $(b\bar{b})$	$10332\ (b^*\bar{b}^*)$; $9460(b^\bullet\bar{b}^\bullet)$	$9338.4\ (b^\bullet\bar{b}^\bullet)^d = (b^\bullet\bar{b}^\bullet) - z_\pi$	$(b^\bullet\bar{b}^\bullet) = 9460$
$D^+;D^0$(~1869); $(c\bar{d})$; $(c\bar{u})$	$(c^+(s\bar{s}v^+)\bar{n})^*;(c^+(s\bar{s}v^+)\bar{p})^*$	$(1863)^d = (c^\bullet\bar{n})$	$(c^+(v\bar{v}v^+)\bar{n})^* \approx 2031$
D_s^+(1968.4) $(c\bar{s})$	$(c^+(s\bar{s}v^+)\bar{s})^*$	$1968\ (c^\bullet\bar{\lambda})^d = (c^\bullet\bar{\lambda}) - z^0$	$(c^+(v\bar{v}v^+)\bar{s})^* \approx 2218$
$B^+;B^0$(~5279) $(u\bar{b})$; $(d\bar{b})$	$(p\bar{b}^*)^*$; $(n\bar{b}^*)^* \approx 5478$	$5278\ (p\bar{b})^d = (p\bar{b}) - z_1$	$(p\bar{b}^\bullet)$;$(p\bar{b}^\bullet) \approx 5042$
B_s^0(5366.3) $(s\bar{b})$	$(s\bar{b}^*)^* = 5666$	$5365.5\ (\lambda\bar{b})^d = (\lambda\bar{b}) - z_2$	$(s\bar{b}) - z_2 = 5430.5$ $(s\bar{b}^\bullet) - z_2 = 5244$
B_c^+(6276±4) $(c\bar{b})$	$(c^*\bar{b}^*)^* = 6884$	$(6297)^d = (c^\bullet\bar{b}^\bullet) = (c\bar{b}^\bullet) - z_5$ $z_5 = 2\,z_2$	$(c\bar{b}^\bullet) = 6440$ $(c\bar{b}) = 6700$

Annex 4: Table 6: *The theoretic masses of heavy vector mesons , conform to CGT*

Heavy mesons (MeV/c^2) -experimental mass-	**Theoretic mass,** (cold meson, CGT)*, MeV/c^2	**Theoretic mass,** (de-excited meson, CGT)^d, MeV/c^2	**Observations + predictions**
$\rho^+(775)$; ρ^0 (775.26); $\rho^-(775)$; $(u\ \bar{d})$; $(d\ \bar{d})$; $(d\ \bar{u})$;	812$(u\ \bar{s})^*$; 813$(d\ \bar{s})^*$; 812 $(s\ \bar{u})^*$	$(777.3)^d = (u\ \bar{s}) - 2z^0$ $(778.3)^d = (d\ \bar{s}) - 2z^0$	$z^0 = 17.37$ MeV/c^2
$\omega(782.65)$; $(u\ \bar{u}+d\ \bar{d})/\sqrt{2}$	813$(d\ \bar{s})^*$	$(795.6)^d = (d\ \bar{s}) - z^0$	
ϕ (1019.46) ; $(s\ \bar{s})$	1009.5 $(s\ \bar{s})^*$	$(1009.5) = (s\ \bar{s})^*$	
J/ψ (3096.9); $(c\ \bar{c})$	3114 $(c^\bullet\ \bar{c}^\bullet)^*$	$(3096.7)^d = (c^\bullet\ \bar{c}^\bullet)^* - z^0$	$m(c^\bullet) = 1.557$ GeV/c^2
Υ(1S) (9460.3) ; $(b\ \bar{b})$	9480 $(b^\bullet\ \bar{b}^\bullet)^*$		$m(b^\bullet) = 4.744$ GeV/c^2
K^{*+} (891.66) ; $(u\ \bar{s})$	870 $(\lambda^+\ \bar{\lambda}^-)$; 935 $(s^-\ \bar{\lambda}^+)$	870 $(\lambda^+\ \bar{\lambda}^-)$; 935 $(s^-\ \bar{\lambda}^+)$	
K^{*0} (895.81) ; $(d\ \bar{s})$	870 $(\lambda^-\ \bar{\lambda}^-)$; 935 $(s^-\ \bar{\lambda}^-)$	871 $(\lambda^-\ \bar{\lambda}^-)$; 936 $(s^-\ \bar{\lambda}^-)$	
D^{*+}(2010.26) ; $(c\ \bar{d})$	2012 $(c\ \bar{d})$	2012 $(c\ \bar{d})$	$m(c) = 1.7$ GeV/c^2
D^{*0}(2007) ; $(c\ \bar{u})$	2011 $(c\ \bar{u})$	2011 $(c\ \bar{u})$	
D^{*+}_s (2112.1) ; $(c\ \bar{s})$	2135 $(c\ \bar{\lambda})$	$2117.6 = (c\ \bar{\lambda}) - z^0$	
B^{*+}(5325.2) ; $(u\ \bar{b})$	5312 $(u\ \bar{b})$; 5435 $(\lambda^+\ \bar{b}^-)$	5312$(u\ \bar{b})$; 5331= $(\lambda^+\ \bar{b}) - z_3$	$m(b) = 5$ GeV/c^2
B^{*0}(5325.2) ; $(d\ \bar{b})$	5313 $(d\ \bar{b})$; 5436 $(\lambda^-\ \bar{b}^-)$	5313$(d\ \bar{b})$; 5332= $(\lambda^-\ \bar{b}) - z_3$	
B^{*0}_s(5415.4) ; $(s\ \bar{b})$	5435 $(\lambda\ \bar{b})$;	5435 $(\lambda\ \bar{b})$;	
B^{*+}_c(unknown) ; $(c\ \bar{b})$	6700 $(c\ \bar{b})$; 6557 $(c^\bullet\ \bar{b})$;	6700 $(c\ \bar{b})$; 6557 $(c^\bullet\ \bar{b})$;	$(c^\bullet\ \bar{b}^\bullet) = 6300$

Annex 5: Table 7: *The theoretic masses of non-excited and de-excited multi-quark baryons, predicted by CGT*

Multi-quark Baryons (q-q-q…q) -predicted by CGT ($c=c^+(^2/_3e)$) ; $b=b^-(-^1/_3e)$) ($t=t^+(^2/_3)e$; $t = (7x5)b$	**Theoretic mass,** GeV/c^2, (CGT)* (cold quarks/baryons)* p^*;$n^*(\sim0.312;)$; $\lambda^{-*}(0.435)$; $s^{-*}(\sim0.5)$; $v^-(0.574)$; $c^{*+}(1.718)$; $b^{*-}(5.166)$; $m(t^*) = (7x5)m(b^*) = 180.81$	**Theoretic mass,** GeV/c^2, (de-excited quarks/baryon)^d p; n^d $(\sim0.312)^d$; $\lambda^-(0.435)^d$; $s^-(\sim0.504)^d$; $v^-(0.574)^d$; $c^+(1.7)^d$; $b^-(\sim5.0)^d$; $m(t) = (7x5)m(b) = 175$	**Observations**
$[(u\ \bar{u})\ \bar{v}^-\ c]^+$; $[(u\ \bar{u})\ \bar{v}^+ b]^-$	$(2.916;\ 6.364)^*$;$[[(u\ \bar{u})\ \bar{v}^+\ b^*]^*$	$(2.898;\ 6.198)^d$; $[(u\ \bar{u})\ \bar{v}^+\ b\ ]^-$	$b = (b)^d$
$[(u\ \bar{u})\ c\ b^-\ ]^0$	$(7.509)^*$ $[(u\ \bar{u})\ c^*\ b^{*-}]^0$	$(7.325)^d$;	
$[(u\ \bar{u})\ v\ c\ b]^0$	$(8.083)^*$	$(7.9)^d$	
$[(u\ \bar{u})\ s\ v\ c\ b]^0$	$(8.583)^*$	$(8.4)^d$	
$[(s\ \bar{s})\ \bar{v}^-\ c]^+$; $[(s\ \bar{s})\ \bar{v}^+ b]^-$	$(3.292\ ;\ 6.74)^*$	$(3.274\ ;\ 6.574)^d$	
$[(s\ \bar{s})\ c\ \bar{b}^-]^+$; $[(v\ \bar{v})\ \bar{s}^-\ c]^+$	$(7.884)^*$; $(3.366)^*$	$(7.7)^d$; $(3.348)^d$	
$[(v\ \bar{v})\ s^+\ \bar{b}]^+$; $[(v\ \bar{v})\ c\ \bar{b}]^+$	$(6.814)^*$; $(8.032)^*$	$(6.648)^d$; $(7.848)^d$	
$[(c\ \bar{c})\ s^+\ \bar{v}^-]^+$	$(4.51)^*$	$(4.474)^d$	
$[(c\ \bar{c})\ s^+\ \bar{b}]^+$; $[(c\ \bar{c})\ v^+\ \bar{b}]^+$	$(9.102)^*$; $(9.174)^*$	$(8.9)^d$; $(8.974)^d$	
$[(b\ \bar{b})\ s^+\ \bar{v}^-]^+$	$(11.406)^*$	$(11.074)^d$	
$[(b\ \bar{b})\ \bar{s}^-\ c]^+$; $[(b\ \bar{b})\ \bar{v}^-\ c]^+$	$(12.55)^*$; $(12.624)^*$	$(12.218)^d$; $(12.292)^d$	
$[(s\ \bar{s})\ v^-c^+b^-]^0$	$(8.458)^*$	$(8.292)^d$	
$[(v\ \bar{v})\ s^-c^+\ b^-]$	$(8.532)^*$	$(8.366)^d$	
$[(c\ \bar{c})\ s^-v^-\ b^-]^-$	$(9.676)^*$	$(9.474)^d$	
$[(b\ \bar{b})\ s^-v^-c^+]^0$	$(13.124)^*$	$(12.81)^d$	
$[s^-\ \bar{v}^-c^+b^-t^+]^+$; $[s^-v^-c^+b^-\ \bar{t}^+\ ]^-$	$(188.7)^*$	$(181.77)^d$	
$[u^+\ s^-\ v^-\ c^+\ b^-\ t^+\ ]^+$ $[n^-\ s^-\ v^-\ c^+\ b^-\ t^+\ ]^0$	$(189.01)^*$	$(182.08)^d$	$t^\pm = (7x5)b^\pm = 17(b\ \bar{b})+b^\pm$