$\chi_{b2}(1P)$

$I^G(J^{PC}) = 0^+(2^{++})$
J needs confirmation.

Observed in radiative decay of the $\Upsilon(2S)$, therefore $C = +$. Branching ratio requires E1 transition, M1 is strongly disfavored, therefore $P = +$. $J = 2$ from SKWARNICKI 87.

$\chi_{b2}(1P)$ MASS

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
9912.6±0.5 OUR AVERAGE	Error includes scale factor of 1.1.			
9911.9±0.3±0.6	[1] EDWARDS	99	CLE2	$\Upsilon(2S) \to \gamma\chi(1P)$
9915.7±1.1±1.3	[1] WALK	86	CBAL	$\Upsilon(2S) \to \gamma\gamma\ell^+\ell^-$
9912.1±0.3±0.9	[1] ALBRECHT	85E	ARG	$\Upsilon(2S) \to$ conv.γX
9912.3±0.8±2.2	[1] NERNST	85	CBAL	$\Upsilon(2S) \to \gamma$X
9913.2±0.7±1.0	[1] HAAS	84	CLEO	$\Upsilon(2S) \to$ conv.γX
9914.5±0.3±2.0	[1] KLOPFEN...	83	CUSB	$\Upsilon(2S) \to \gamma$X
9914 ±4	[1] PAUSS	83	CUSB	$\Upsilon(2S) \to \gamma\gamma\ell^+\ell^-$

[1] From γ energy below, assuming $\Upsilon(2S)$ mass = 10023.3 MeV.

γ ENERGY IN $\Upsilon(2S)$ DECAY

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
110.1±0.5 OUR AVERAGE	Error includes scale factor of 1.1.			
110.8±0.3±0.6	EDWARDS	99	CLE2	$\Upsilon(2S) \to \gamma\chi(1P)$
107.0±1.1±1.3	WALK	86	CBAL	$\Upsilon(2S) \to \gamma\gamma\ell^+\ell^-$
110.6±0.3±0.9	ALBRECHT	85E	ARG	$\Upsilon(2S) \to$ conv.γX
110.4±0.8±2.2	NERNST	85	CBAL	$\Upsilon(2S) \to \gamma$X
109.5±0.7±1.0	HAAS	84	CLEO	$\Upsilon(2S) \to$ conv.γX
108.2±0.3±2.0	KLOPFEN...	83	CUSB	$\Upsilon(2S) \to \gamma$X
108.8±4.0	PAUSS	83	CUSB	$\Upsilon(2S) \to \gamma\gamma\ell^+\ell^-$

$\chi_{b2}(1P)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\gamma\,\Upsilon(1S)$	(22±4) %

$\chi_{b2}(1P)$ BRANCHING RATIOS

$\Gamma(\gamma\,\Upsilon(1S))/\Gamma_{total}$ — Γ_1/Γ

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.22±0.04 OUR AVERAGE				
0.27±0.06±0.06	WALK	86	CBAL	$\Upsilon(2S) \to \gamma\gamma\ell^+\ell^-$
0.20±0.05	KLOPFEN...	83	CUSB	$\Upsilon(2S) \to \gamma\gamma\ell^+\ell^-$

$\chi_{b2}(1P)$ REFERENCES

EDWARDS	99	PR D59 032003	K.W. Edwards *et al.*	(CLEO Collab.)
SKWARNICKI	87	PRL 58 972	T. Skwarnicki *et al.*	(Crystal Ball Collab.) J
WALK	86	PR D34 2611	W.S. Walk *et al.*	(Crystal Ball Collab.)
ALBRECHT	85E	PL 160B 331	H. Albrecht *et al.*	(ARGUS Collab.)
NERNST	85	PRL 54 2195	R. Nernst *et al.*	(Crystal Ball Collab.)
HAAS	84	PRL 52 799	J. Haas *et al.*	(CLEO Collab.)
KLOPFEN...	83	PRL 51 160	C. Klopfenstein *et al.*	(CUSB Collab.)
PAUSS	83	PL 130B 439	F. Pauss *et al.*	(MPIM, COLU, CORN, LSU+)