^{62}Ni(p,p),(p,p′),(p,n):res 1976Ar01,1970Br33,1966Bo26

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Full Evaluation	Jun Chen	NDS 196,17 (2024)	30-Sep-2023

Also includes (p,γ):res from 1978Br35, 1974Wi15, 1972Sz01.

1976Ar01: (p,p) E=3.4-4.0 MeV proton beams (FWHM=0.4 keV) were produced from a Van de Graaff accelerator at Tokyo Institute of Technology. Target was 99.93% enriched metallic ^{62}Ni. Scattered protons were detected with four surface-barrier detectors, Measured $\sigma(E_p)$. Deduced IAR levels, J, π, L(p), widths from R-matrix analysis. 1976Ar01 state that from the R-matrix analysis, 152 s-wave, 44 p-wave, 20 d-wave and 1 f-wave resonances were extracted. But only p-wave and possible g-wave resonances are explicitly listed by the authors.

1970Br33: (p,p),(p,n) E=1.8-3.3 MeV protons (FWHM=0.3-0.45 keV) were produced from TUNL 3-MV Van de Graaff. Target was 97.9% enriched ^{62}Ni. Measured $\sigma(E_p)$. Deduced IAR levels, J, π, widths from Breit-Wigner analysis and R-matrix analysis.

1966Bo26: (p,n) E≤8 MeV protons. Measured $\sigma(E_p)$. Deduced IAR levels.

Others:

1974Ra07: (p,p),(p,p′) E=2.5-5.0 MeV proton beams (step=2 keV) were produced from the Universite Laval CN Van de Graaff accelerator. Target was 100 μg/cm^2 99% enriched self-supporting ^{62}Ni. Scattered protons were detected with surface barrier detectors (FWHM=25 keV). Measured $\sigma(E_p)$. Deduced IAR levels, J, π, widths.

1974Wi15: (p,p), (p,p′),(p,γ) E=2.3-2.7 MeV protons were produced at TUNL. Target was 98.8% enriched ^{62}Cu. Measured $\sigma(E_p)$. Deduced resonance levels, widths.

1973Ta23,1972Ta09: (p,p) E=2.43-2.63 MeV protons were from the Kyoto 10-MeV tandem Van de Graaff accelerator. Target was 223 μg/cm^2 self-supporting foil of ^{62}Ni. Measured $\sigma(E_p,\theta)$. Deduced IAR levels, J.

1969Gu07: (p,p),(p,p′),(p,n) E=3-8 MeV protons. Measured $\sigma(E_p)$. Deduced IAR levels.

1966Ga14: (p,p),(p,p′) E≈2.8-4.0 MeV protons. Measured $\sigma(E_p)$. Deduced IAR levels.

1978Br35: (p,γ) E=3.74-3.81 MeV. Measured $\sigma(E\gamma)$. Deduced IAR levels, widths.

1972Sz01: (p,γ) E=3.75-3.81 MeV. Measured $\sigma(E\gamma)$. Deduced IAR levels, widths.

1984SiZR,1984SiZQ: (p,γ) E=2.23-2.73 MeV.

1985IzZZ: (p,γ) E=1.943-3.185 MeV. Measured $\sigma(E\gamma)$. Deduced resonances.

1975Kr06,1975Kr10: E=2.481, 2.546, 2.512, 2.556, 2.659. Measured $\sigma(E_\gamma)$. Deduced IAS.

^{63}Cu Levels

E(p)(lab) and Γ under comments and J^π are from 1970Br33 up to 9175 level (E(p)=3002), and from 1976Ar01 above that, unless otherwise noted.

E(level)†	J^π‡	Γ_p‡	Comments
8389 *2*	1/2$^+$	15 eV	E(p)(lab)=2304 *2*.
8400 *2*	1/2$^+$	10 eV	E(p)(lab)=2315 *2*.
8467 *2*	1/2$^+$	15 eV	E(p)(lab)=2383 *2*.
8500 *2*	1/2$^+$	15 eV	E(p)(lab)=2417 *2*.
8523 *2*	1/2$^+$	125 eV	E(p)(lab)=2440 *2*.
8526 *2*	1/2$^+$	30 eV	E(p)(lab)=2443 *2*.
8538 *2*	(1/2$^+$)	15 eV	E(p)(lab)=2455 *2*. E(level): possible unresolved doublet (1970Br33).
8551 *2*	1/2$^+$	35 eV	E(p)(lab)=2468 *2*.
8556 *2*	1/2$^-$	30 eV	E(p)(lab)=2474 *2*.
8558 *2*	1/2$^+$	30 eV	E(p)(lab)=2476 *2*.
8562 *2*	1/2$^+$	135 eV	E(p)(lab)=2480 *2*.
8563 *2*	1/2$^-$	180 eV	E(p)(lab)=2481 *2*, IAS(g.s. ^{63}Ni) (1970Br33). Other: 2481 (1975Kr06). Other Γ_p=800 eV, $\Gamma_{p'}$(to 1172)=2 eV, S=0.39 (1974Ra07). $\Gamma_p\Gamma_{\gamma 0}$=0.44 eV *8* (1975Kr06).
8574 *2*	1/2$^+$	90 eV	E(p)(lab)=2492 *2*.
8594			E(p)(lab)=2512 (1975Kr06). (2J+1)$\Gamma_p\Gamma_{\gamma 0}$=0.32 eV *10* (1975Kr06).

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^{62}Ni(p,p),(p,p′),(p,n):res 1976Ar01,1970Br33,1966Bo26 (continued)

^{63}Cu Levels (continued)

E(level)†	Jπ‡	Γ_p‡	L‡	Comments
8612 *2*	1/2+	30 eV		E(p)(lab)=2530 *2*.
8618 *2*	1/2+	10 eV		E(p)(lab)=2537 *2*.
8627	(5/2−)			Jπ: from 1975Kr06. E(p)(lab)=2546 (1975Kr06). (2J+1)$\Gamma_p\Gamma_{\gamma 0}$=0.11 eV *3* (1975Kr06).
8632 *2*	1/2+	65 eV		E(p)(lab)=2551 *2*.
8637	(5/2−)			Jπ: from 1975Kr06. E(p)(lab)=2556 (1975Kr06). (2J+1)$\Gamma_p\Gamma_{\gamma 0}$=0.28 eV *10* (1975Kr06).
8657.7	5/2−		3	E(p)(lab)=2576.6 (1972Ta09). Jπ,L: from polarization angular distribution in 1972Ta09.
8661 *2*	1/2+	25 eV		E(p)(lab)=2580 *2*.
8686 *2*	1/2+	50 eV		E(p)(lab)=2606 *2*.
8692.9	3/2−	20 eV	1	E(p)(lab)=2612.3 (1974Wi15). Other: 2612 *2* (1970Br33). Γ_p=20 eV, $\Gamma_{p'}$(to 1172)=0.069 eV, Γ_γ=0.13 eV (1974Wi15).
8694.4	3/2−		1	E(p)(lab)=2613.9 (1974Wi15). Other: 2613 *2* (1970Br33). Γ_p=15 eV, $\Gamma_{p'}$(to 1172)=0.119 eV, Γ_γ=0.04 eV (1974Wi15).
8706 *2*	1/2+	55 eV		E(p)(lab)=2626 *2*.
8713 *2*	1/2+	60 eV		E(p)(lab)=2633 *2*.
8716.7	3/2−	5 eV	1	Jπ,Γ: from 1974Wi15. E(p)(lab)=2636.5 (1974Wi15). $\Gamma_{p'}$(to 1172)=0.019 eV, Γ_γ=0.03 eV (1974Wi15).
8717.8	3/2−	10 eV	1	Jπ: from 1974Wi15. E(p)(lab)=2637.6 (1974Wi15). Other: 2638 *2* (1970Br33). Γ_p=10 eV, $\Gamma_{p'}$(to 1172)=0.101 eV, Γ_γ=0.19 eV (1974Wi15).
8719.1	3/2−	5 eV	1	Jπ: from 1974Wi15. E(p)(lab)=2639.0 (1974Wi15). Other: 2639 *2* (1970Br33). Γ_p=5 eV, $\Gamma_{p'}$(to 1172)=0.026 eV, Γ_γ=0.13 eV (1974Wi15).
8726.6	3/2−	15 eV	1	E(p)(lab)=2646.6 (1974Wi15). Other: 2646 *2* (1970Br33). Γ_p=15 eV, $\Gamma_{p'}$(to 1172)=0.225 eV, Γ_γ=0.26 eV (1974Wi15).
8730.6	3/2−	10 eV	1	Jπ: from 1974Wi15. E(p)(lab)=2650.6 (1974Wi15). Other: 2649 *2* (1970Br33). Γ_p=10 eV, $\Gamma_{p'}$(to 1172)=0.248 eV, Γ_γ=0.15 eV (1974Wi15).
8731 *2*	1/2+	15 eV		E(p)(lab)=2651 *2*.
8733.5	3/2−	5 eV	1	Γ: from 1974Wi15. E(p)(lab)=2653.6 (1974Wi15). Γ_p=5 eV, $\Gamma_{p'}$(to 1172)=0.122 eV, Γ_γ=0.16 eV (1974Wi15).
8736.3	3/2−	10 eV	1	Jπ: from 1974Wi15. E(p)(lab)=2656.4 (1974Wi15), IAS(156 ^{63}Ni). Other: 2656 *2* (1970Br33). Γ_p=10 eV, $\Gamma_{p'}$(to 1172)=0.278 eV, Γ_γ=0.09 eV (1974Wi15). Γ_p=400 eV, $\Gamma_{p'}$(to 1172)=20 eV, S=0.11 (1974Ra07).
8740 *2*	1/2+	40 eV		E(p)(lab)=2661 *2*.
8741.5	3/2−	40 eV	1	E(p)(lab)=2661.7 (1974Wi15). Others: 2658 *2* (1970Br33), 2659 (1975Kr06). Γ_p=40 eV, $\Gamma_{p'}$(to 1172)=0.585 eV, Γ_γ=0.34 eV (1974Wi15). (2J+1)$\Gamma_p\Gamma_{\gamma 0}$=0.24 eV *10* (1975Kr06).
8742 *2*	3/2−	20 eV		E(p)(lab)=2663 *2*.
8742.9	3/2−	125 eV	1	E(p)(lab)=2663.1 (1974Wi15). Other: 2659 *2* (1970Br33). Γ_p=125 eV, $\Gamma_{p'}$(to 1172)=1.194 eV, Γ_γ=0.38 eV (1974Wi15).
8746.1	3/2−	5 eV	1	Jπ,Γ: from 1974Wi15. E(p)(lab)=2666.4 (1974Wi15). $\Gamma_{p'}$(to 1172)=0.195 eV, Γ_γ=0.04 eV (1974Wi15).
8747.2	3/2−	20 eV	1	Jπ,Γ: from 1974Wi15. E(p)(lab)=2667.5 (1974Wi15). $\Gamma_{p'}$(to 1172)=0.164 eV, Γ_γ=0.09 eV (1974Wi15).

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^{62}Ni(p,p),(p,p′),(p,n):res 1976Ar01,1970Br33,1966Bo26 (continued)

^{63}Cu Levels (continued)

E(level)†	Jπ‡	Γ_p‡	L‡	Comments
8750.0	3/2⁻	5 eV	1	Jπ,Γ: from 1974Wi15. E(p)(lab)=2670.4 (1974Wi15). $\Gamma_{p'}$(to 1172)=0.228 eV, Γ_γ=0.11 eV (1974Wi15).
8750 *2*	1/2⁺	10 eV		E(p)(lab)=2671 *2*.
8760 *2*	1/2⁺	50 eV		E(p)(lab)=2681 *2*.
8765 *2*	(3/2⁻)	10 eV		E(p)(lab)=2686 *2*.
8794 *2*	1/2⁺	15 eV		E(p)(lab)=2715 *2*.
8798 *2*	1/2⁺	15 eV		E(p)(lab)=2719 *2*.
8799 *2*	(3/2⁻,1/2⁻)	10 eV		E(p)(lab)=2721 *2*.
8800 *2*	(3/2⁻,1/2⁻)	10 eV		E(p)(lab)=2722 *2*.
8801 *2*	1/2⁺	10 eV		E(p)(lab)=2723 *2*.
8806 *2*	(5/2⁺,3/2⁺)	5 eV		E(p)(lab)=2728 *2*.
8812 *2*	1/2⁺	40 eV		E(p)(lab)=2734 *2*.
8820 *2*	1/2⁺	55 eV		E(p)(lab)=2742 *2*.
8829 *2*	1/2⁺	10 eV		E(p)(lab)=2751 *2*.
8836 *2*	1/2⁺	45 eV		E(p)(lab)=2758 *2*.
8837 *2*	1/2⁺	10 eV		E(p)(lab)=2759 *2*.
8876 *2*	1/2⁺	145 eV		E(p)(lab)=2799 *2*.
8884 *2*	1/2⁺	60 eV		E(p)(lab)=2807 *2*.
8898 *2*	1/2⁺	25 eV		E(p)(lab)=2821 *2*.
8905 *2*	(1/2⁺)	5 eV		E(p)(lab)=2828 *2*.
8919 *2*	1/2⁺	10 eV		E(p)(lab)=2842 *2*.
8922 *2*	1/2⁻	20 eV		E(p)(lab)=2846 *2*.
8924 *2*	1/2⁺	10 eV		E(p)(lab)=2848 *2*.
8931 *2*	1/2⁺	20 eV		E(p)(lab)=2855 *2*.
8937 *2*	1/2⁺	90 eV		E(p)(lab)=2861 *2*.
8943 *2*	1/2⁺	115 eV		E(p)(lab)=2867 *2*.
8975 *2*	1/2⁺	20 eV		E(p)(lab)=2899 *2*.
8992 *2*	1/2⁺	35 eV		E(p)(lab)=2917 *2*.
9000 *2*	1/2⁺	35 eV		E(p)(lab)=2925 *2*.
9001 *2*	1/2⁺	10 eV		E(p)(lab)=2926 *2*.
9002 *2*	(5/2⁺,3/2⁺)	5 eV		E(p)(lab)=2927 *2*.
9014 *2*	1/2⁺	100 eV		E(p)(lab)=2939 *2*.
9020 *2*	(1/2⁻)	15 eV		E(p)(lab)=2945 *2*.
9021 *2*	1/2⁺	40 eV		E(p)(lab)=2946 *2*.
9029 *2*	1/2⁺	20 eV		E(p)(lab)=2954 *2*.
9033 *2*	1/2⁺	30 eV		E(p)(lab)=2958 *2*.
9038 *2*	1/2⁺	40 eV		E(p)(lab)=2963 *2*.
9043 *2*	1/2⁺	90 eV		E(p)(lab)=2968 *2*.
9048 *2*	1/2⁺	30 eV		E(p)(lab)=2974 *2*.
9050 *2*	1/2⁺	70 eV		E(p)(lab)=2976 *2*.
9057 *2*	1/2⁺	75 eV		E(p)(lab)=2983 *2*.
9058 *2*	(5/2⁺,3/2⁺)	10 eV		E(p)(lab)=2984 *2*.
9064 *2*	1/2⁺	15 eV		E(p)(lab)=2990 *2*.
9068.0	1/2⁻,3/2⁻	20.0 eV *6*	1	Jπ: 1/2⁻ from 1970Br33, 3/2⁻ from 1976Ar01. Γ,L: from 1976Ar01. Other: Γ_p=20 eV (1970Br33). E(p)(lab)=2993.5 from 1976Ar01. Other: 2992 *2* (1970Br33).
9068 *2*	(5/2⁺,3/2⁺)	5 eV		E(p)(lab)=2994 *2*.
9090 *2*	1/2⁺	40 eV		E(p)(lab)=3016 *2*.
9092 *2*	1/2⁺	50 eV		E(p)(lab)=3018 *2*.
9094 *2*	1/2⁺	95 eV		E(p)(lab)=3020 *2*.
9097 *2*	1/2⁺	40 eV		E(p)(lab)=3023 *2*.
9103 *2*	1/2⁺	35 eV		E(p)(lab)=3029 *2*.
9109 *2*	1/2⁻	10 eV		E(p)(lab)=3036 *2*.
9109.5	1/2⁻,3/2⁻	25 eV *4*	1	E(p)(lab)=3035.7 (1976Ar01). Other: 3034 *2* (1970Br33).

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^{62}Ni(p,p),(p,p′),(p,n):res 1976Ar01,1970Br33,1966Bo26 (continued)

^{63}Cu Levels (continued)

E(level)†	Jπ‡	Γ_p‡	L‡	S#	Comments
					Jπ: 1/2⁻ from 1970Br33, 3/2⁻ from 1976Ar01.
					Γ,L: from 1976Ar01. Other: Γ_p=25 eV (1970Br33).
9111.5	3/2⁻	5.1 eV *3*	1		Jπ,Γ,L: from 1976Ar01.
					E(p)(lab)=3037.7 (1976Ar01).
9111 *2*	1/2⁺	25 eV			E(p)(lab)=3038 *2*.
9115 *2*	1/2⁻	20 eV			E(p)(lab)=3042 *2*.
9118.0	3/2⁻	17 eV *4*	1	0.067	Jπ: from 1976Ar01. Other: 1/2⁻ (1970Br33).
					Γ: other: 110 eV (1970Br33).
					E(p)(lab)=3044.3 from 1976Ar01, IAS(518 ^{63}Ni). Other: 3044 *2* (1970Br33).
					Γ_p=600 eV, $\Gamma_{p'}$(to 1172)=54 eV, S=0.07 (1974Ra07).
9119.6	3/2⁻	73 eV *5*	1		Jπ,Γ: other: 1/2⁺, 35 eV (1970Br33).
					E(p)(lab)=3046.0 from 1976Ar01. Other: 3046 *2* (1970Br33).
9123.2	3/2⁻	15 eV *4*			Jπ,Γ: other: 1/2⁺, 20 eV (1970Br33).
					E(p)(lab)=3049.6 from 1976Ar01. Other: 3048 *2* (1970Br33).
9123 *2*	1/2⁻	30 eV			E(p)(lab)=3050 *2*.
9125.5	3/2⁻	21 eV *4*			Jπ,Γ: other: 1/2⁺, 100 eV (1970Br33).
					E(p)(lab)=3052.0 from 1976Ar01. Other: 3053 *2* (1970Br33).
9127 *2*	(5/2⁺)	15 eV			E(p)(lab)=3054 *2*.
9133.2	3/2⁻	71 eV *4*			Jπ,Γ: from 1976Ar01. Other: 1/2⁻, 95 eV (1970Br33).
					E(p)(lab)=3059.8 from 1976Ar01. Other: 3058 *2* (1970Br33).
9135.2	3/2⁻	19.2 eV *34*			Jπ,Γ: from 1976Ar01. Other: 1/2⁻, 30 eV (1970Br33).
					E(p)(lab)=3061.8 from 1976Ar01. Other: 3060 *2* (1970Br33).
9137 *2*	1/2⁺	60 eV			E(p)(lab)=3064 *2*.
9146 *2*	1/2⁺	20 eV			E(p)(lab)=3073 *2*.
9151 *2*	(3/2⁻,1/2⁻)	10 eV			E(p)(lab)=3078 *2*.
9152 *2*	(3/2⁻,1/2⁻)	10 eV			E(p)(lab)=3079 *2*.
9153 *2*	1/2⁺	20 eV			E(p)(lab)=3080 *2*.
9161 *2*	(1/2⁻,3/2⁻)	5 eV			E(p)(lab)=3088 *2*.
9166 *2*	1/2⁺	60 eV			E(p)(lab)=3093 *2*.
9169 *2*	1/2⁺	35 eV			E(p)(lab)=3097 *2*.
9170 *2*	(1/2⁻,3/2⁻)	5 eV			E(p)(lab)=3098 *2*.
9174 *2*	(3/2⁻,1/2⁻)	5 eV			E(p)(lab)=3102 *2*.
9205.0	1/2⁻	30 eV	1		E(p)(lab)=3132.8.
9273.1	1/2⁻	30 eV	1		E(p)(lab)=3202.0.
9278.2	1/2⁻	30 eV	1		E(p)(lab)=3207.2.
9362.9	3/2⁻	10 eV	1		E(p)(lab)=3293.2.
9363.9	3/2⁻	12 eV	1		E(p)(lab)=3294.2.
9364.6	1/2⁻	63 eV	1		E(p)(lab)=3295.0.
9389.4	1/2⁻	16 eV	1		E(p)(lab)=3320.2.
9421.3	1/2⁻	40 eV	1		E(p)(lab)=3352.6.
9508.0	1/2⁻	66 eV	1		E(p)(lab)=3440.7.
9537.8	1/2⁻	69 eV *7*	1		E(p)(lab)=3471.0.
9549.0	1/2⁻	82 eV *12*	1		E(p)(lab)=3482.4.
9566.4	1/2⁻	170 eV *15*	1		E(p)(lab)=3500.0.
9567.1	1/2⁻	66 eV *14*	1		E(p)(lab)=3500.8.
9571.1	1/2⁻	86 eV *11*	1		E(p)(lab)=3504.8.
9575.0	1/2⁻	104 eV *10*	1		E(p)(lab)=3508.8.
9575.9	1/2⁻	191 eV *13*	1		E(p)(lab)=3509.7.
9582.7	1/2⁻	207 eV *13*	1	0.215	E(p)(lab)=3516.6, IAS(1001 ^{63}Ni) (1976Ar01).
					Γ_p=2.2, $\Gamma_{p'}$(to 1172)=0.056, S=0.10 (1974Ra07).
9585.6	1/2⁻	125 eV *11*	1		E(p)(lab)=3519.6.
9595.2	1/2⁻	160 eV *13*	1		E(p)(lab)=3529.3.
9596.1	1/2⁻	512 eV *19*	1		E(p)(lab)=3530.2.
9598.4	1/2⁻	51 eV *8*	1		E(p)(lab)=3532.6.

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^{62}Ni(p,p),(p,p′),(p,n):res 1976Ar01,1970Br33,1966Bo26 (continued)

^{63}Cu Levels (continued)

E(level)†	Jπ‡	Γ_p‡	L‡	S#	Comments
9607.9	3/2−	41 eV *5*	1		E(p)(lab)=3542.2.
9615.2	1/2−	31 eV *7*	1		E(p)(lab)=3549.6.
9618.7	1/2−	50 eV *8*	1		E(p)(lab)=3553.2.
9631.3	1/2−	25 eV	1		E(p)(lab)=3566.0.
9682.3	1/2−	35 eV	1		E(p)(lab)=3617.8.
9807.7	9/2+		4		E(p)(lab)=3745.3 (1978Br35). $\Gamma_p\Gamma_\gamma/\Gamma$=0.04 eV *3* (1978Br35).
9810.6	1/2−	40 eV	1		E(p)(lab)=3748.2.
9812.2	9/2+		4		E(p)(lab)=3749.8 (1978Br35), 3751 *4* (1972Sz01). $\Gamma_p\Gamma_\gamma/\Gamma$=0.05 eV *3* (1978Br35), 0.10 eV *4* (1972Sz01).
9822.2	1/2−	32 eV *7*	1		E(p)(lab)=3760.0.
9823.5	3/2−	13 eV *5*	1		E(p)(lab)=3761.3.
9830.2	1/2−	46 eV *6*	1		E(p)(lab)=3768.1.
9836.7	9/2+		4		E(p)(lab)=3774.7, doublet (1978Br35); 3774 *4* (1972Sz01). $\Gamma_p\Gamma_\gamma/\Gamma$=0.08 eV *4* (1978Br35), 0.21 eV *5* (1972Sz01).
9848	9/2+				E(p)(lab)=3787, IAS(1292 ^{63}Ni) from 1976Ar01 in (p,p) and 1972Sz01 and 1978Br35 in (p,γ). Other: 3788.0 (1978Br35), 3786 *4* (1972Sz01). $\Gamma_p\Gamma_\gamma/\Gamma$=0.11 eV *4* (1978Br35), 0.45 eV *5* (1972Sz01),
9852.5	9/2+		4		E(p)(lab)=3790.8 (1978Br35), 3790 *4* (1972Sz01). $\Gamma_p\Gamma_\gamma/\Gamma$=0.16 eV *5* (1978Br35), 0.66 eV *6* (1972Sz01).
9854.4	9/2+		4		E(p)(lab)=3792.7 (1978Br35). $\Gamma_p\Gamma_\gamma/\Gamma$=0.14 eV *4* (1978Br35).
9855.5	9/2+		4		E(p)(lab)=3793.8 (1978Br35). $\Gamma_p\Gamma_\gamma/\Gamma$=0.13 eV *4* (1978Br35). Additional information 1.
9856.6	9/2+		4		E(p)(lab)=3795.0 (1978Br35). $\Gamma_p\Gamma_\gamma/\Gamma$=0.24 eV *7* (1978Br35).
9857.6	9/2+		4		E(p)(lab)=3796.0 (1978Br35). $\Gamma_p\Gamma_\gamma/\Gamma$=0.13 eV *4* (1978Br35).
9858.9	9/2+		4		E(p)(lab)=3797.3 (1978Br35). $\Gamma_p\Gamma_\gamma/\Gamma$=0.07 eV *4* (1978Br35).
9859.7	3/2−	26.5 eV *32*	1		E(p)(lab)=3798.1.
9863.5	9/2+		4		E(p)(lab)=3802.0 (1978Br35). $\Gamma_p\Gamma_\gamma/\Gamma$=0.04 eV *2* (1978Br35).
9866.8	3/2−	22 eV *4*	1	0.0050	E(p)(lab)=3805.3, IAS(1324 ^{63}Ni) (1976Ar01).
9868.8	9/2+		4		E(p)(lab)=3807.4 (1978Br35), 3806 *4* (1972Sz01). $\Gamma_p\Gamma_\gamma/\Gamma$=0.09 eV *5* (1978Br35), 0.24 eV *4* (1972Sz01).
9888.5	3/2−	23.4 eV *4*	1		E(p)(lab)=3827.4.
9915.2	1/2−	72 eV *7*	1		E(p)(lab)=3854.5.
9922.0	1/2−	81.7 eV *7*	1		E(p)(lab)=3861.4.
≈10860	5/2+				E(level): estimated by the evaluator. IAS(2294 ^{63}Ni); Γ_p=8.3, $\Gamma_{p'}$(to 1172)=1.45, $\Gamma_{p'}$(to 2047)=0.026, S=0.14 (1974Ra07).
10950					E(p)(lab)=4907, IAS(2529 ^{63}Ni) (1966Bo26).
11145					E(p)(lab)=5105, IAS(2701 ^{63}Ni) (1966Bo26).
11243					E(p)(lab)=5204, IAS(2824 ^{63}Ni) (1966Bo26).
11383					E(p)(lab)=5347, IAS(2960 ^{63}Ni) (1966Bo26).
11553					E(p)(lab)=5519, IAS(3100 ^{63}Ni) (1966Bo26).
11633					E(p)(lab)=5601, IAS(3173 ^{63}Ni) (1966Bo26).
11725					E(p)(lab)=5694, IAS(3291 ^{63}Ni) (1966Bo26).
11858					E(p)(lab)=5829, IAS(3428 ^{63}Ni) (1966Bo26).
11961					E(p)(lab)=5934, IAS(3553 ^{63}Ni) (1966Bo26).
12099					E(p)(lab)=6074, IAS(3657 ^{63}Ni) (1966Bo26).

Continued on next page (footnotes at end of table)

^{62}Ni(p,p),(p,p′),(p,n):res 1976Ar01,1970Br33,1966Bo26 (continued)

^{63}Cu Levels (continued)

† From E(level)=E(p)(c.m.)+S(p)(^{63}Cu), where S(p)=6122.40 *6* (2021Wa16) and E(p)(c.m.)=E(p)(lab)×m(^{62}Ni)/[m(p)+m(^{62}Ni)].
‡ From R-matrix analysis of measured $\sigma(E_p)$. L-values are from 1976Ar01. J^π and Γ_p are from 1970Br33 and L from 1974Wi15 up to 9175 level and from 1976Ar01 above that, unless otherwise noted.
# From 1976Ar01.