^{163}Dy(n,γ),(n,n):resonances 2006MuZX,2017Sh50

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen[#]	NDS 147, 1 (2018)	30-Nov-2017

J^π(^{163}Dy g.s.)=5/2$^-$.

2006MuZX: evaluated data for neutron resonances.

2017Sh50: E(n)=16.2 eV to 997.3 eV. Measured resonance energies, J^π, Γ_n and Γ_γ for 127 resonances at LINAC Center of Rensselaer Polytechnic Institute (RPI). The data analyzed by R-matrix method using SAMMY computer code, finding 17 new resonances. Comparison were made with data in the ENDF/B-VII.1 evaluation.

Additional information 1.

2017Va25: E(n)=subthermal to few hundred MeV. Measured Eγ, Iγ, multistep cascade spectra (MSCs) at isolated n-resonances of 10.26 eV,2$^+$; 10.85 eV,3$^+$; 19.65 eV,3$^-$; 35.79 eV,2$^-$; 37.71 eV,3$^+$; 78.99 eV,2$^-$; 94.08 eV,3$^-$; and 299.92 eV,2$^+$ using DANCE array with 160 BaF_2 detectors at LANSC-Los Alamos facility. Deduced Photon strength functions (γ-PFS), total widths for E1 and M1 transitions, and level densities. Comparison with statistical model calculations using DICEBOX code, and with experimental results using other reactions.

1975Li02: E(n)=1.7 to 997 eV. Measured energies and resonance parameters for 114 resonances.

1975Al01: measured magnetic moment for a resonance.

Others: 1999Vo02, 1985Se22, 1974KaYY, 1972WaYP, 1971Br16, 1970Mu08, 1970Mu19, 1965Ce01.

^{164}Dy Levels

S(n)(^{164}Dy)=7658.11 *7* (2017Wa10).

E(level)[†]	J$^\pi$[‡]	Comments
S(n)-0.00446?	3$^-$	Fictitious level. Γ_γ=(105) meV.
S(n)+1713×10^{-6} *4*	2$^-$	2gΓ_n=1.7 meV *1*, 2gΓ_n^0=1.30 meV *8*, Γ_γ=102.6 meV *8*,
S(n)+0.00581 *2*		2gΓ_n=0.027 meV *5*, 2gΓ_n^0=0.011 meV *2*.
S(n)+0.01026[#]	2$^+$	
S(n)+0.01085[#]	3$^+$	
S(n)+0.01623 *3*	3$^-$	2gΓ_n=21.3 meV *8*, 2gΓ_n^0=5.29 meV *20*, Γ_γ=105 meV *13*. E(res)=16.200 eV *1*, J^π=3$^-$, Γ_n=21.8 meV *2* (2017Sh50).
S(n)+0.01965 *3*	3$^-$	2gΓ_n=1.00 meV *3*, 2gΓ_n^0=0.230 meV *7*. E(res)=19.70 eV *1*, J^π=3$^-$, Γ_n=0.8 meV (2017Sh50).
S(n)+0.03579 *4*	2$^-$	2gΓ_n=8.2 meV *6*, 2gΓ_n^0=1.4 meV *1*. E(res)=35.800 eV *2*, J^π=2$^-$, Γ_n=13.5 meV *2* (2017Sh50).
S(n)+0.03771[#]	3$^+$	
S(n)+0.05027 *6*	3$^-$	2gΓ_n=3.3 meV *4*, 2gΓ_n^0=0.47 meV *6*. E(res)=50.30 eV *1*, J^π=3$^-$, Γ_n=3.3 meV *1* (2017Sh50).
S(n)+0.05585 *8*	3$^-$	2gΓ_n=28 meV *2*, 2gΓ_n^0=3.7 meV *3*, Γ_γ=120 meV *12*. E(res)=55.900 eV 2, J^π=3$^-$, Γ_γ=137.5 meV *49*, Γ_n=26.8 meV *4* (2017Sh50).
S(n)+0.05897 *8*	2$^-$	2gΓ_n=82 meV *4*, 2gΓ_n^0=11.1 meV *5*, Γ_γ=111 meV *15*. E(res)=59.100 eV *3*, J^π=2$^-$, Γ_γ=106.2 meV *49*, Γ_n=105.0 meV *22* (2017Sh50).
S(n)+0.06611 *10*	3$^-$	2gΓ_n=8.4 meV *8*, 2gΓ_n^0=1.03 meV *10*. E(res)=66.100 eV *5*, J^π=3$^-$, Γ_n=8.5 meV *2* (2017Sh50).
S(n)+0.07200 *11*	2$^-$	2gΓ_n=3.5 meV *3*, 2gΓ_n^0=0.42 meV *4*. E(res)=72.00 eV *1*, J^π=2$^-$, Γ_n=4.4 meV *2* (2017Sh50).
S(n)+0.0723 *5*	3$^-$	
S(n)+0.07548 *10*	2$^-$	2gΓ_n=2.3 meV *1*, 2gΓ_n^0=0.270 meV *12*. E(res)=75.40 eV *1*, J^π=2$^-$, Γ_n=3.6 meV *2* (2017Sh50).
S(n)+0.07899 *13*	2$^-$	2gΓ_n=14.5 meV *8*, 2gΓ_n^0=1.63 meV *9*. E(res)=79.000 eV *5*, J^π=2$^-$, Γ_n=20.8 meV *5* (2017Sh50).
S(n)+0.08630 *14*	3$^-$	2gΓ_n=1.2 meV *3*, 2gΓ_n^0=0.12 meV *3*. E(res)=86.30 eV *3*, J^π=3$^-$, Γ_n=1.3 meV *1* (2017Sh50).

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^{163}Dy(n,γ),(n,n):resonances 2006MuZX,2017Sh50 (continued)

^{164}Dy Levels (continued)

E(level)†	Jπ‡	Comments
S(n)+0.09408 *8*	3⁻	2gΓn=20 meV *2*, 2gΓ^0_n=2.1 meV *2*. E(res)=94.10 eV *1*, J^π=3⁻, Γn=19.4 meV *4* (2017Sh50).
S(n)+0.10588 *10*	3⁻	2gΓn=63 meV *8*, 2gΓ^0_n=6.1 meV *8*. E(res)=105.900 eV *4*, J^π=3⁻, Γγ=119.6 meV *79*, Γn=65.8 meV *15* (2017Sh50).
S(n)+0.10718 *10*	2⁻	2gΓn=28 meV *4*, 2gΓ^0_n=2.7 meV *4*. E(res)=107.20 eV *1*, J^π=2⁻, Γγ=110.1 meV *84*, Γn=39.4 meV *9* (2017Sh50).
S(n)+0.12033 *12*	3⁻	2gΓn=9.6 meV *8*, 2gΓ^0_n=0.875 meV *73*. E(res)=120.40 eV *1*, J^π=3⁻, Γn=9.7 meV *4* (2017Sh50).
S(n)+0.12658 *13*	3⁻	2gΓn=17.8 meV *30*, 2gΓ^0_n=1.58 meV *27*. E(res)=126.60 eV *1*, J^π=3⁻, Γn=16.8 meV *5* (2017Sh50).
S(n)+0.12746 *13*	3⁻	2gΓn=13.1 meV *20*, 2gΓ^0_n=1.16 meV *18*. E(res)=127.50 eV *1*, J^π=3⁻, Γn=13.2 meV *4* (2017Sh50).
S(n)+0.13531 *14*	3⁻	2gΓn=5.3 meV *6*, 2gΓ^0_n=0.46 meV *5*. E(res)=135.40 eV *2*, J^π=3⁻, Γn=5.7 meV *3* (2017Sh50).
S(n)+0.14338 *15*	2⁻	2gΓn=17.0 meV *18*, 2gΓ^0_n=1.42 meV *5*. E(res)=143.50 eV *1*, J^π=2⁻, Γn=16.8 meV *7* (2017Sh50).
S(n)+0.14497 *15*	2⁻	2gΓn=46 meV *5*, 2gΓ^0_n=0.3.8 meV *4*, Γγ=100 meV *20*. E(res)=145.00 eV *1*, J^π=2⁻, Γγ=103.6 meV *91*, Γn=54.3 meV *19* (2017Sh50).
S(n)+0.15502 *17*	2⁻	2gΓn=83 meV *7*, 2gΓ^0_n=6.7 meV *6*, Γγ=110 meV *20*. E(res)=155.10 eV *1*, J^π=2⁻, Γγ=100.1 meV *80*, Γn=105.9 meV *67* (2017Sh50).
S(n)+0.16381 *19*	3⁻	2gΓn=12.0 meV *13*, 2gΓ^0_n=0.94 meV *10*. E(res)=163.90 eV *1*, J^π=3⁻, Γn=11.2 meV *5* (2017Sh50).
S(n)+0.17718 *21*	3⁻	2gΓn=4.0 meV *6*, 2gΓ^0_n=0.30 meV *5*. E(res)=177.20 eV *4*, J^π=3⁻, Γn=3.7 meV *3* (2017Sh50).
S(n)+0.18509 *22*	3⁻	2gΓn=5.4 meV *8*, 2gΓ^0_n=0.40 meV *6*. E(res)=185.20 eV *3*, J^π=3⁻, Γn=4.4 meV *3* (2017Sh50).
S(n)+0.18895 *23*	2⁻	2gΓn=3.4 meV *4*, 2gΓ^0_n=0.25 meV *3*. E(res)=189.00 eV *5*, J^π=2⁻, Γn=4.2 meV *3* (2017Sh50).
S(n)+0.20290 *25*	2⁻	2gΓn=21 meV *3*, 2gΓ^0_n=1.5 meV *2*. E(res)=203.00 eV *2*, J^π=2⁻, Γγ=106.0 meV *102*, Γn=22.2 meV *11* (2017Sh50).
S(n)+0.20526 *26*	3⁻	2gΓn=54 meV *6*, 2gΓ^0_n=3.8 meV *4*, Γγ=95 meV *20*. E(res)=205.40 eV *1*, J^π=3⁻, Γγ=100.4 meV *91*, Γn=54.2 meV *22* (2017Sh50).
S(n)+0.21374 *27*	3⁻	2gΓn=6.7 meV *6*, 2gΓ^0_n=0.46 meV *4*. E(res)=213.80 eV *3*, J^π=3⁻, Γn=6.4 meV *4* (2017Sh50).
S(n)+0.22415 *30*	2⁻	2gΓn=180 meV *20*, 2gΓ^0_n=12 meV *1*, Γγ=160 meV *35*. E(res)=223.90 eV *2*, J^π=2⁻, Γγ=101.5 meV *69*, Γn=189.7 meV *151* (2017Sh50).
S(n)+0.22460@ *2*	3⁻	Γγ=108.3 meV, Γn=30.1 meV *23* (2017Sh50).
S(n)+0.23354 *32*	3⁻	2gΓn=7.3 meV *9*, 2gΓ^0_n=0.48 meV *6*. E(res)=233.70 eV *4*, J^π=3⁻, Γn=6.2 meV *4* (2017Sh50).
S(n)+0.25055 *18*	3⁻	2gΓn=18 meV *2*, 2gΓ^0_n=1.1 meV *1*. E(res)=250.70 eV *2*, J^π=3⁻, Γn=15.6 meV *8* (2017Sh50).
S(n)+0.26113 *19*	3⁻	2gΓn=107 meV *9*, 2gΓ^0_n=6.62 meV *56*, Γγ=87 meV *20*. E(res)=261.30 eV *1*, J^π=3⁻, Γγ=99.8 meV *78*, Γn=107.3 meV *78* (2017Sh50).
S(n)+0.26801 *19*	3⁻	2gΓn=140 meV *16*, 2gΓ^0_n=8.55 meV *98*, Γγ=90 meV *25*. E(res)=268.20 eV *1*, J^π=3⁻, Γγ=98.9 meV *73*, Γn=133.1 meV *96* (2017Sh50).
S(n)+0.27417 *20*	2⁻	2gΓn=28 meV *4*, 2gΓ^0_n=1.7 meV *2*. E(res)=274.40 eV *2*, J^π=2⁻, Γγ=115.9 meV *114*, Γn=37.5 meV *21* (2017Sh50).
S(n)+0.28106 *21*	3⁻	2gΓn=31 meV *4*, 2gΓ^0_n=1.84 meV *20*. E(res)=281.20 eV *2*, J^π=3⁻, Γγ=110.5 meV *108*, Γn=27.8 meV *14* (2017Sh50).
S(n)+0.28885 *22*	2⁻	2gΓn=126 meV *17*, 2gΓ^0_n=7.4 meV *10*, Γγ=130 meV *25*. E(res)=289.10 eV *2*, J^π=2⁻, Γγ=94.9 meV *62*, Γn=145.2 meV *119* (2017Sh50).
S(n)+0.29600 *29*	2⁻*d*	2gΓn=5.9 meV *14*, 2gΓ^0_n=0.34 meV *8*. E(res)=295.90 eV *7*, J^π=2⁻, Γn=7.9 meV *7* (2017Sh50).
S(n)+0.29730@ *7*	2⁻	Γγ=108.3 meV, Γn=13.0 meV *12* (2017Sh50).
S(n)+0.29777 *23*	2⁻	2gΓn=86 meV *14*, 2gΓ^0_n=5.0 meV *8*.

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^{163}Dy(n,γ),(n,n):resonances 2006MuZX,2017Sh50 (continued)

^{164}Dy Levels (continued)

E(level)†	Jπ‡	Comments
		E(res)=298.10 eV *2*, J^π=2$^-$, Γ_γ=92.8 meV *76*, Γ_n=92.6 meV *8* (2017Sh50).
S(n)+0.29992#	2$^+$	
S(n)+0.30710& *46*	3$^-$	2gΓ_n=1.6 meV *10*, 2gΓ_n^0=0.092 meV *60*.
S(n)+0.32308 *25*	3$^-$	2gΓ_n=280 meV *40*, 2gΓ_n^0=15.6 meV *22*, Γ_γ=128 meV *25*. E(res)=323.10 eV *2*, J^π=3$^-$, Γ_γ=103.8 meV *55*, Γ_n=252.8 meV *223* (2017Sh50).
S(n)+0.32455 *26*	3$^-$	2gΓ_n=270 meV *40*, 2gΓ_n^0=15.0 meV *22*, Γ_γ=100 meV *25*. E(res)=324.70 eV *2*, J^π=3$^-$, Γ_γ=101.1 meV *69*, Γ_n=257.4 meV *198* (2017Sh50).
S(n)+0.32693 *26*	2$^-$[c]	2gΓ_n=35.1 meV *69*, 2gΓ_n^0=1.94 meV *38*. E(res)=327.20 eV *3*, J^π=2$^-$, Γ_γ=108.7 meV *109*, Γ_n=34.0 meV *20* (2017Sh50).
S(n)+0.32973 *26*	2$^-$[a]	2gΓ_n=17 meV *4*, 2gΓ_n^0=0.94 meV *20*. E(res)=329.70 eV *5*, J^π=2$^-$, Γ_n=19.3 meV *13* (2017Sh50).
S(n)+0.34286 *26*	3$^-$	2gΓ_n=23 meV *4*, 2gΓ_n^0=1.24 meV *22*. E(res)=343.10 eV *4*, J^π=3$^-$, Γ_n=20.0 meV *13* (2017Sh50).
S(n)+0.34832 *29*	2$^-$	2gΓ_n=240 meV *40*, 2gΓ_n^0=12.8 meV *20*, Γ_γ=110 meV *25*. E(res)=348.40 eV *2*, J^π=2$^-$, Γ_γ=96.0 meV *59*, Γ_n=297.4 meV *244* (2017Sh50).
S(n)+0.36864 *31*	2$^-$[a]	2gΓ_n=170 meV *20*, 2gΓ_n^0=6.8 meV *10*, Γ_γ=120 meV *25*. E(res)=368.80 eV *2*, J^π=2$^-$, Γ_γ=134.3 meV *96*, Γ_n=214.3 meV *173* (2017Sh50).
S(n)+0.37496 *32*	3$^-$	2gΓ_n=3.8 meV *14*, 2gΓ_n^0=0.20 meV *7*. E(res)=375.40 eV *17*, J^π=3$^-$, Γ_n=3.3 meV *3* (2017Sh50).
S(n)+0.38216 *33*	2$^-$[a]	2gΓ_n=5.1 meV *16*, 2gΓ_n^0=0.26 meV *8*. E(res)=382.40 eV *7*, J^π=2$^-$, Γ_n=6.1 meV *6* (2017Sh50).
S(n)+0.38701 *33*	2$^-$[a]	2gΓ_n=24.0 meV *35*, 2gΓ_n^0=1.24 meV *18*. E(res)=387.30 eV *4*, J^π=2$^-$, Γ_γ=112.1 meV *111*, Γ_n=32.9 meV *23* (2017Sh50).
S(n)+0.39044 *34*	3$^-$[b]	2gΓ_n=55 meV *8*, 2gΓ_n^0=2.8 meV *4*, Γ_γ=90 meV *25*. E(res)=390.60 eV *3*, J^π=3$^-$, Γ_γ=89.9 meV *85*, Γ_n=45.0 meV *28* (2017Sh50).
S(n)+0.40034 *35*	2$^-$[a]	2gΓ_n=28 meV *6*, 2gΓ_n^0=1.4 meV *3*. E(res)=400.40 eV *4*, J^π=2$^-$, Γ_γ=109.4 meV *108*, Γ_n=34.6 meV *24* (2017Sh50).
S(n)+0.40315 *35*	2$^-$[c]	2gΓ_n=3.4 meV *20*, 2gΓ_n^0=0.17 meV *8*. E(res)=403.10 eV *19*, J^π=2$^-$, Γ_n=4.0 meV *4* (2017Sh50).
S(n)+0.41108 *37*	2$^-$	2gΓ_n=540 meV *60*, 2gΓ_n^0=26.6 meV *30*, Γ_γ=155 meV *30*. E(res)=411.40 eV *2*, J^π=2$^-$, Γ_γ=176.0 meV *89*, Γ_n=626.9 meV *401* (2017Sh50).
S(n)+0.42056 *38*	3$^-$[d]	2gΓ_n=2.8 meV *10*, 2gΓ_n^0=0.14 meV *5*. E(res)=420.80 eV *23*, J^π=3$^-$, Γ_n=2.5 meV *2* (2017Sh50).
S(n)+0.42938 *39*	3$^-$[b]	2gΓ_n=46 meV *6*, 2gΓ_n^0=2.22 meV *30*, Γ_γ=70 meV *20*. E(res)=429.60 eV *4*, J^π=3$^-$, Γ_γ=67.4 meV *63*, Γ_n=36.2 meV *26* (2017Sh50).
S(n)+0.45484 *43*	3$^-$	2gΓ_n=94 meV *13*, 2gΓ_n^0=4.4 meV *6*, Γ_γ=150 meV *30*. E(res)=455.10 eV *3*, J^π=3$^-$, Γ_γ=147.8 meV *140*, Γ_n=75.9 meV *45* (2017Sh50).
S(n)+0.45921 *43*	3$^-$[e]	2gΓ_n=30 meV *6*, 2gΓ_n^0=1.40 meV *28*. E(res)=459.50 eV *6*, J^π=3$^-$, Γ_γ=107.8 meV *107*, Γ_n=22.5 meV *16* (2017Sh50).
S(n)+0.46532 *44*	3$^-$[b]	2gΓ_n=22 meV *4*, 2gΓ_n^0=1.02 meV *18*. E(res)=465.50 eV *6*, J^π=3$^-$, Γ_n=20.7 meV *15* (2017Sh50).
S(n)+0.47910 *46*	2$^-$[a]	2gΓ_n=70 meV *9*, 2gΓ_n^0=3.2 meV *4*, Γ_γ=150 meV *30*. E(res)=479.40 eV *4*, J^π=2$^-$, Γ_γ=148.6 meV *138*, Γ_n=85.1 meV *61* (2017Sh50).
S(n)+0.48355 *47*	2$^-$[a]	2gΓ_n=79 meV *9*, 2gΓ_n^0=3.6 meV *4*, Γ_γ=120 meV *25*. E(res)=484.00 eV *4*, J^π=2$^-$, Γ_γ=120.1 meV *110*, Γ_n=94.7 meV *69* (2017Sh50).
S(n)+0.50270@ *15*	2$^-$	Γ_γ=108.3 meV, Γ_n=9.3 meV *8* (2017Sh50).
S(n)+0.50450@ *11*	2$^-$	Γ_γ=108.3 meV, Γ_n=22.5 meV *21* (2017Sh50).
S(n)+0.50459 *25*	2$^-$	2gΓ_n=120 meV *14*, 2gΓ_n^0=5.2 meV *6*, Γ_γ=80 meV *25*. E(res)=505.20 eV *5*, J^π=2$^-$, Γ_γ=62.1 meV *51*, Γ_n=126.9 meV *121* (2017Sh50).
S(n)+0.51634 *26*	3$^-$	2gΓ_n=30 meV *6*, 2gΓ_n^0=1.32 meV *26*. E(res)=516.50 eV *6*, J^π=3$^-$, Γ_γ=114.0 meV *113*, Γ_n=25.8 meV *19* (2017Sh50).
S(n)+0.51983 *26*	2$^-$[a]	2gΓ_n=22 meV *4*, 2gΓ_n^0=0.96 meV *18*. E(res)=519.40 eV *11*, J^π=2$^-$, Γ_γ=101.2 meV *101*, Γ_n=19.5 meV *17* (2017Sh50).
S(n)+0.52040@ *13*	2$^-$	Γ_γ=108.3 meV, Γ_n=14.1 meV *13* (2017Sh50).

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^{163}Dy(n,γ),(n,n):resonances 2006MuZX,2017Sh50 (continued)

^{164}Dy Levels (continued)

E(level)†	J^π‡	Comments
S(n)+0.53318 *27*	2^{-d}	2gΓ_n=200 meV *30*, 2gΓ_n^0=8.6 meV *14*, Γ_γ=130 meV *30*. E(res)=533.60 eV *4*, J^π=2$^-$, Γ_γ=122.2 meV *85*, Γ_n=248.3 meV *22* (2017Sh50).
S(n)+0.54222 *28*	2^{-a}	2gΓ_n=240 meV *40*, 2gΓ_n^0=10.4 meV *13*, Γ_γ=135 meV *30*. E(res)=542.70 eV *3*, J^π=2$^-$, Γ_γ=125.3 meV *88*, Γ_n=342.2 meV *284* (2017Sh50).
S(n)+0.56429 *29*	2^-	2gΓ_n=62 meV *10*, 2gΓ_n^0=2.6 meV *4*, Γ_γ=85 meV *25*. E(res)=564.60 eV *6*, J^π=2$^-$, Γ_γ=87.4 meV *79*, Γ_n=76.7 meV *65* (2017Sh50).
S(n)+0.56902 *30*	2^{-a}	2gΓ_n=124 meV *14*, 2gΓ_n^0=5.2 meV *6*, Γ_γ=150 meV *30*. E(res)=569.40 eV *3*, J^π=2$^-$, Γ_γ=157.1 meV *137*, Γ_n=157.6 meV *127* (2017Sh50).
S(n)+0.58079 *31*	3^{-d}	2gΓ_n=88 meV *12*, 2gΓ_n^0=3.7 meV *5*, Γ_γ=130 meV *30*. E(res)=581.10 eV *5*, J^π=3$^-$, Γ_γ=126.3 meV *118*, Γ_n=73.2 meV *55* (2017Sh50).
S(n)+0.59452 *32*	3^-	2gΓ_n=98 meV *15*, 2gΓ_n^0=4.0 meV *6*. E(res)=594.80 eV *5*, J^π=3$^-$, Γ_γ=112.3 meV *103*, Γ_n=86.7 meV *69* (2017Sh50).
S(n)+0.60125 *32*	2^{-a}	2gΓ_n=150 meV *20*, 2gΓ_n^0=6.0 meV *8*, Γ_γ=120 meV *30*. E(res)=601.50 eV *4*, J^π=2$^-$, Γ_γ=143.9 meV *124*, Γ_n=199.3 meV *166* (2017Sh50).
S(n)+0.61571 *34*	3^-	2gΓ_n=70 meV *10*, 2gΓ_n^0=2.8 meV *4*, Γ_γ=75 meV *20*. E(res)=616.2 eV *1*, J^π=3$^-$, Γ_γ=73.1 meV *66*, Γ_n=57.3 meV *46* (2017Sh50).
S(n)+0.62077 *34*	2^{-e}	2gΓ_n=100 meV *15*, 2gΓ_n^0=4.0 meV *6*, Γ_γ=110 meV *25*. E(res)=621.0 eV *1*, J^π=2$^-$, Γ_γ=122.4 meV *110*, Γ_n=134.4 meV *121* (2017Sh50).
S(n)+0.63210 *35*	3^{-d}	2gΓ_n=210 meV *40*, 2gΓ_n^0=8.4 meV *14*, Γ_γ=125 meV *30*. E(res)=632.7 eV *1*, J^π=3$^-$, Γ_γ=95.8 meV *72*, Γ_n=155.1 meV *139* (2017Sh50).
S(n)+0.63717 *35*	2^{-e}	2gΓ_n=160 meV *30*, 2gΓ_n^0=6.2 meV *12*, Γ_γ=135 meV *30*. E(res)=637.6 eV *1*, J^π=2$^-$, Γ_γ=135.7 meV *114*, Γ_n=196.4 meV *175* (2017Sh50).
S(n)+0.64196 *36*	3^{-c}	2gΓ_n=160 meV *30*, 2gΓ_n^0=6.4 meV *12*, Γ_γ=100 meV *30*. E(res)=642.4 eV *1*, J^π=3$^-$, Γ_γ=77.4 meV *63*, Γ_n=112.1 meV *93* (2017Sh50).
S(n)+0.64626 *36*	3^-	2gΓ_n=120 meV *20*, 2gΓ_n^0=4.8 meV *8*, Γ_γ=150 meV *40*. E(res)=646.8 eV *1*, J^π=3$^-$, Γ_γ=151.1 meV *143*, Γ_n=102.1 meV *71* (2017Sh50).
S(n)+0.65220 *47*	2^{-d}	2gΓ_n=6 meV *3*, 2gΓ_n^0=0.22 meV *10*. E(res)=652.6 eV *3*, J^π=2$^-$, Γ_n=108.6 meV *74* (2017Sh50).
S(n)+0.66040& *48*	3^-	2gΓ_n=19 meV *5*, 2gΓ_n^0=0.74 meV *20*.
S(n)+0.6668@ *1*	2^-	Γ_γ=108.3 meV, Γ_n=49.5 meV *42* (2017Sh50).
S(n)+0.6852@ *3*	3^-	Γ_γ=108.3 meV, Γ_n=6.6 meV *6* (2017Sh50).
S(n)+0.68695 *39*	3^{-c}	2gΓ_n=24 meV *6*, 2gΓ_n^0=0.92 meV *22*. E(res)=687.6 eV *1*, J^π=3$^-$, Γ_n=22.3 meV *20* (2017Sh50).
S(n)+0.6940@ *3*	2^-	Γ_γ=108.3 meV, Γ_n=12.6 meV *12* (2017Sh50).
S(n)+0.69571 *40*	2^{-a}	2gΓ_n=160 meV *30*, 2gΓ_n^0=6 meV *1*, Γ_γ=115 meV *30*. E(res)=696.3 eV *1*, J^π=2$^-$, Γ_γ=118.9 meV *103*, Γ_n=199.6 meV *184* (2017Sh50).
S(n)+0.70978 *53*	2^{-c}	2gΓ_n=8 meV *4*, 2gΓ_n^0=0.30 meV *16*. E(res)=710.3 eV *3*, J^π=2$^-$, Γ_n=10.1 meV *10* (2017Sh50).
S(n)+0.71249 *42*	2^{-d}	2gΓ_n=75 meV *10*, 2gΓ_n^0=2.8 meV *4*, Γ_γ=95 meV *30*. E(res)=712.8 eV *1*, J^π=2$^-$, Γ_γ=94.3 meV *88*, Γ_n=90.4 meV *83* (2017Sh50).
S(n)+0.7141@ *2*	2^-	Γ_γ=108.3 meV, Γ_n=20.8 meV *20* (2017Sh50).
S(n)+0.72132 *43*	3^{-d}	2gΓ_n=86 meV *0*, 2gΓ_n^0=3.2 meV *4*, Γ_γ=75 meV *25*. E(res)=721.7 eV *1*, J^π=3$^-$, Γ_γ=75.2 meV *70*, Γ_n=73.1 meV *63* (2017Sh50).
S(n)+0.73205 *44*	3^{-c}	2gΓ_n=19 meV *5*, 2gΓ_n^0=0.70 meV *18*. E(res)=732.4 eV *1*, J^π=3$^-$, Γ_n=17.0 meV *17* (2017Sh50).
S(n)+0.73614 *56*	3^{-c}	2gΓ_n=20 meV *5*, 2gΓ_n^0=0.72 meV *18*. E(res)=736.4 eV *2*, J^π=3$^-$, Γ_n=17.4 meV *16* (2017Sh50).
S(n)+0.74169 *44*	3^{-c}	2gΓ_n=22 meV *6*, 2gΓ_n^0=0.80 meV *22*. E(res)=742.4 eV *2*, J^π=3$^-$, Γ_n=19.8 meV *18* (2017Sh50).
S(n)+0.74715 *57*	2^{-c}	2gΓ_n=7 meV *3*, 2gΓ_n^0=0.24 meV *10*. E(res)=747.3 eV *4*, J^π=2$^-$, Γ_n=8.4 meV *8* (2017Sh50).
S(n)+0.75605 *46*	3^{-c}	2gΓ_n=52 meV *12*, 2gΓ_n^0=1.90 meV *44*, Γ_γ=85 meV *30*.

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^{163}Dy(n,γ),(n,n):resonances 2006MuZX,2017Sh50 (continued)

^{164}Dy Levels (continued)

E(level)[†]	Jπ[‡]	Comments
		E(res)=756.4 eV *1*, $J^\pi=3^-$, Γ_γ=82.4 meV *80*, Γ_n=41.7 meV *36* (2017Sh50).
S(n)+0.7585[@] *3*	2^-	Γ_γ=108.3 meV, Γ_n=13.2 meV *13* (2017Sh50).
S(n)+0.76431 *60*	2^{-d}	$2g\Gamma_n$=18 meV *8*, $2g\Gamma_n^0$=0.64 meV *28*. E(res)=764.5 eV *2*, $J^\pi=2^-$, Γ_n=22.0 meV *21* (2017Sh50).
S(n)+0.7675[@] *3*	2^-	Γ_γ=108.3 meV, Γ_n=15.0 meV *14* (2017Sh50).
S(n)+0.76993 *60*	3^{-c}	$2g\Gamma_n$=6.7 meV *33*, $2g\Gamma_n^0$=0.24 meV *12*. E(res)=770.6 eV *4*, $J^\pi=3^-$, Γ_n=5.8 meV *6* (2017Sh50).
S(n)+0.77655 *61*	3^-	$2g\Gamma_n$=28 meV *6*, $2g\Gamma_n^0$=1.00 meV *22*. E(res)=776.7 eV *2*, $J^\pi=3^-$, Γ_γ=108.0 meV *88*, Γ_n=24.3 meV *22* (2017Sh50).
S(n)+0.79440 *63*	3^-	$2g\Gamma_n$=54 meV *12*, $2g\Gamma_n^0$=1.92 meV *42*. E(res)=794.5 eV *1*, $J^\pi=3^-$, Γ_γ=110.0 meV *109*, Γ_n=47.5 meV *42* (2017Sh50).
S(n)+0.7961[@] *2*	2^-	Γ_γ=108.3 meV, Γ_n=23.1 meV *22* (2017Sh50).
S(n)+0.80951 *51*	2^{-e}	$2g\Gamma_n$=260 meV *60*, $2g\Gamma_n^0$=9.2 meV *22*. E(res)=810.2 eV *1*, $J^\pi=2^-$, Γ_γ=138.5 meV *112*, Γ_n=362.3 meV *366* (2017Sh50).
S(n)+0.81229 *51*	2^{-e}	$2g\Gamma_n$=50 meV *16*, $2g\Gamma_n^0$=1.76 meV *56*. E(res)=813.2 eV *1*, $J^\pi=2^-$, Γ_γ=117.8 meV *119*, Γ_n=69.7 meV *68* (2017Sh50).
S(n)+0.82304 *52*	3^-	$2g\Gamma_n$=48 meV *16*, $2g\Gamma_n^0$=1.68 meV *56*. E(res)=823.4 eV *1*, $J^\pi=3^-$, Γ_γ=109.3 meV *109*, Γ_n=41.9 meV *37* (2017Sh50).
S(n)+0.83086 *53*	2^{-c}	$2g\Gamma_n$=87 meV *17*, $2g\Gamma_n^0$=3.0 meV *6*. E(res)=831.6 eV *1*, $J^\pi=2^-$, Γ_γ=109.6 meV *103*, Γ_n=105.4 meV *97* (2017Sh50).
S(n)+0.8349[@] *3*	3^-	Γ_γ=108.3 meV, Γ_n=11.4 meV *11* (2017Sh50).
S(n)+0.84662 *69*	3^{-c}	$2g\Gamma_n$=13 meV *7*, $2g\Gamma_n^0$=0.44 meV *24*. E(res)=845.9 eV *2*, $J^\pi=3^-$, Γ_n=11.2 meV *11* (2017Sh50).
S(n)+0.8505[@] *2*	2^-	Γ_γ=108.3 meV, Γ_n=24.1 meV *24* (2017Sh50).
S(n)+0.85116 *54*	2^{-c}	$2g\Gamma_n$=160 meV *35*, $2g\Gamma_n^0$=5.4 meV *12*. E(res)=852.0 eV *1*, $J^\pi=2^-$, Γ_γ=108.5 meV *95*, Γ_n=192.6 meV *186* (2017Sh50).
S(n)+0.85775 *70*	2^{-c}	$2g\Gamma_n$=59 meV *18*, $2g\Gamma_n^0$=2.0 meV *6*. E(res)=858.4 eV *1*, $J^\pi=2^-$, Γ_γ=112.6 meV *111*, Γ_n=75.3.6 meV *70* (2017Sh50).
S(n)+0.8641[@] *2*	3^-	Γ_γ=108.3 meV, Γ_n=26.7 meV *24* (2017Sh50).
S(n)+0.86492 *56*	2^{-c}	$2g\Gamma_n$=52 meV *16*, $2g\Gamma_n^0$=1.76 meV *54*. E(res)=865.9 eV *2*, $J^\pi=2^-$, Γ_γ=105.8 meV *104*, Γ_n=59.4 meV *55* (2017Sh50).
S(n)+0.87391 *57*	3^-	$2g\Gamma_n$=120 meV *30*, $2g\Gamma_n^0$=4 meV *1*. E(res)=874.2 eV *1*, $J^\pi=3^-$, Γ_γ=108.2 meV *101*, Γ_n=100.8 meV *88* (2017Sh50).
S(n)+0.89965 *30*	2^-	$2g\Gamma_n$=180 meV *42*, $2g\Gamma_n^0$=6.0 meV *14*. E(res)=900.8 eV *1*, $J^\pi=2^-$, Γ_γ=97.4 meV *79*, Γ_n=210.2 meV *203* (2017Sh50).
S(n)+0.91871 *31*	3^{-c}	$2g\Gamma_n$=91 meV *18*, $2g\Gamma_n^0$=3.0 meV *6*. E(res)=919.2 eV *1*, $J^\pi=3^-$, Γ_γ=105.1 meV *100*, Γ_n=74.1 meV *66* (2017Sh50).
S(n)+0.9207[@] *2*	3^-	Γ_γ=108.3 meV, Γ_n=41.2 meV *38* (2017Sh50).
S(n)+0.92979 *31*	2^{-c}	$2g\Gamma_n$=210 meV *49*, $2g\Gamma_n^0$=6.8 meV *16*. E(res)=930.5 eV *1*, $J^\pi=2^-$, Γ_γ=98.5 meV *84*, Γ_n=240.0 meV *222* (2017Sh50).
S(n)+0.93575 *80*	3^{-c}	$2g\Gamma_n$=38 meV *20*, $2g\Gamma_n^0$=1.24 meV *66*. E(res)=936.0 eV *2*, $J^\pi=3^-$, Γ_γ=108.8 meV *108*, Γ_n=32.5 meV *29* (2017Sh50).
S(n)+0.93949 *32*	3^{-c}	$2g\Gamma_n$=260 meV *80*, $2g\Gamma_n^0$=8.4 meV *26*. E(res)=940.1 eV *1*, $J^\pi=3^-$, Γ_γ=86.4 meV *68*, Γ_n=207.9 meV *195* (2017Sh50).
S(n)+0.94967 *32*	2^{-c}	$2g\Gamma_n$=140 meV *37*, $2g\Gamma_n^0$=4.4 meV *12*. E(res)=950.0 eV *1*, $J^\pi=2^-$, Γ_γ=103.5 meV *95*, Γ_n=169.6 meV *161* (2017Sh50).
S(n)+0.9546[@] *4*	2^-	Γ_γ=108.3 meV, Γ_n=15.3 meV *15* (2017Sh50).
S(n)+0.95775 *83*	3^{-c}	$2g\Gamma_n$=36 meV *12*, $2g\Gamma_n^0$=1.16 meV *38*. E(res)=958.2 eV *1*, $J^\pi=3^-$, Γ_γ=109.5 meV *109*, Γ_n=31.3 meV *30* (2017Sh50).
S(n)+0.96735 *84*	2^{-c}	$2g\Gamma_n$=48 meV *16*, $2g\Gamma_n^0$=1.54 meV *52*. E(res)=967.5 eV *2*, $J^\pi=2^-$, Γ_γ=111.4 meV *111*, Γ_n=60.8 meV *58* (2017Sh50).
S(n)+0.97284 *34*	2^{-c}	$2g\Gamma_n$=230 meV *62*, $2g\Gamma_n^0$=7.4 meV *20*. E(res)=973.7 eV *1*, $J^\pi=2^-$, Γ_γ=120.8 meV *106*, Γ_n=294.9 meV *294* (2017Sh50).

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^{163}Dy(n,γ),(n,n):resonances 2006MuZX,2017Sh50 (continued)

^{164}Dy Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
S(n)+0.98052 *86*	3^{-}[c]	$2g\Gamma_n$=13 meV *8*, $2g\Gamma_n^0$=0.42 meV *26*. E(res)=980.9 eV *4*, $J^{\pi}=3^{-}$, Γ_n=11.3 meV *11* (2017Sh50).
S(n)+0.99660 *88*	2^{-}[c]	$2g\Gamma_n$=54 meV *18*, $2g\Gamma_n^0$=1.72 meV *58*. E(res)=997.3 eV *2*, $J^{\pi}=2^{-}$, Γ_{γ}=109.8 meV *109*, Γ_n=66.3 meV *63* (2017Sh50).

[†] Energies and widths of resonances are from 2006MuZX evaluation, unless otherwise stated.
[‡] From 2017Sh50 and 2006MuZX. When different, assignments are from 2017Sh50.
[#] Resonance from 2017Va25.
[@] New resonance from 2017Sh50.
[&] Resonance not observed by 2017Sh50.
[a] From 2017Sh50. 2006MuZX give 3^{-}.
[b] From 2017Sh50. 2006MuZX give 2^{-}.
[c] From 2017Sh50. 2006MuZX give negative parity.
[d] From 2017Sh50. 2006MuZX give $(2)^{-}$.
[e] From 2017Sh50. 2006MuZX give $(3)^{-}$.