Target isotope: $^{90}_{40}$Zr $I^{\pi}_{\circ} = 0^+$ *Abundance:* 51.45(40) % $S_{\rm p} = 5158.8(24)$ keV

$^{91}_{41}$Nb(p)

$E_\circ$ [keV]	$2J^\pi$	$\Gamma_{\rm p}$ [keV]	$\Gamma_{\rm p_1}$ [keV]	$\Gamma_{\rm p_2}$ [keV]	Γ [keV]	$E^*_{\rm analog}$ [keV]	$S_{\rm pp}$	$S_{\rm dp}$	$E_{\rm cm}$ [keV]	E^* [keV]	Ref.			
4716(6)	5^+	3.8(5)			24(2)	0	0.98	0.89	4664	9823	73Gr08	72Sp02	72Co21	
5915(5)*	1^+	33(2)			88(4)	1205			5850	11009	68Th07	69Ha0A	72Se07	71Ri11
6219(6)		1.0(5)	⟨>1⟩	⟨4.8⟩	5.6(10)	1466			6150	11309	99Bb23	68Li11		
6460(10)									6389	11548	99Bb23			
6649(6)	⟨7⟩					1882			6576	11735	99Bb23			
6808(10)	3^+	16(2)	⟨1.9⟩	⟨4.1⟩	42(3)	2042			6714	11873	68Th07	66Mo02	99Bb23	68Li11
6875(7)	⟨9^+⟩					2131			6799	11958	99Bb23	69Ha0A	69Wi15	69ClZZ
6954(6)	⟨7^+⟩	⟨2.5⟩		⟨2.6⟩	28(2)	2201			6877	12036	99Bb23	68Li11	69Jo20	
7002(6)						2260			6925	12084	99Bb23			
7129(6)						2367			7050	12209	99Bb23			
7284(4)	1^+	17(3)	26(2)	9.3	63(5)	2558			7207	12366	99Bb23	72Se07	66Lo06	68Li11
7360(7)						2580			7279	12438	69Jo20	99Bb23		
7412(10)						2640			7330	12489	69Jo20	99Bb23		
7523(6)						2775			7440	12599	69Jo20	99Bb23		
7587(6)						2826			7503	12662	99Bb23			
7645(5)	3^+	2	⟨1.6⟩	⟨6.4⟩	40(5)	2871			7557	12716	99Bb23	72Se07	69Wi15	69ClZZ
7730(6)									7645	12804	99Bb23			
7766(10)									7680	12839	69Jo20	99Bb23		
7850(10)	3^+	8	4.4	15	47(2)	3083			7748	12907	99Bb23	69ClZZ	72Se07	69Wi15
8042(10)	3^+	6			30	3290			7967	13126	99Bb23	72Se07	69Wi15	69ClZZ
8206(6)									8116	13275	99Bb23			
8246(10)					28(2)				8155	13319	99Bb23			
8317(10)	⟨7^+,9^+⟩					3469			8226	13380	99Bb23	70Co01	69Wi15	69ClZZ
8442(5)	3^+	⟨<5⟩	≥8	≥12	48(5)	3681			8349	13507	69Wi15	69Gr25	70Co01	69ClZZ
8570(10)									8480	13635	99Bb23			
8784(10)									8687	13846	99Bb23			
8894(10)									8796	13957	99Bb23			
9071(10)									8971	14131	99Bb23			
9249(10)									9147	14311	99Bb23			
9317(10)									9215	14374	99Bb23			

Additional data on this isotope can be found in [83Fl02, 77Fe12, 72Co21, 71Kr21, 71Ma48, 71Ri11, 70Li07, 69Sc22, 69Sh23, 68Li11, 68Ra15, 67Mo06, 66Lo06, 65Ri01].

* Fine structure of this $s_{1/2}$ resonance was observed in [71Ri11].

Maximum at $E_\circ$=6250 keV in the excitation function for population of the first excited state of ^{90}Zr by inelastic proton scattering [62Ne02] was accompanied by the maxima at the following proton energies: $E_\circ$=3935, 4086, 4202, 4302, 4341, 4386, 4411, 4492, 4540, 4581, 4773, 4843, 4970, 5053, 5181, 5269, 5323, 5370, 5485, 5598, 5687, 5800, 5901 and 5984 keV.

$E_{\rm res}$=6810 ($2J^\pi$=3^+), 7670 (3^+), 7850 (3^+), 8090 (3^+) and 8470 keV (3^+) are given in [69Wi15] without reference to the frame used. We admit the possibility of additional corrections of the order 60 keV for the energies given here.

$E_\circ$ for the last 9 resonances are from [68Li11]; averaged $E_\circ$ from the sets of data are shifted downwards by 60 keV [70Li07]. Recommended energies E^*, $E_{\rm cm}$ and $E^*_{\rm analog}$ in [99Bb23] are based mainly on [68Li11, 68Th07, 69Jo20] with a small correction for the beam energy loss in the target. Strong resonances in (p,pe) reaction were observed in ^{91}Nb at $E_\circ$=7.3, 8.0 and 8.4 MeV.

Target isotope: $^{91}_{40}$Zr $I^{\pi}_{\circ} = 5/2^+$ *Abundance:* 11.22(5) % $S_p = 5846.8(18)$ keV

$^{92}_{41}$Nb(p)

$E_\circ$ [keV]	J^π	Γ [keV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.		
3215	0^+		0	3161	9008(18)	66Lo06	92Ba29	
4154(10)	2^+	33(2)	934	4109	9956(10)	66Lo06	92Ba29	71Ki06
4700	4^+		1496	4649	10496(40)	66Lo06	92Ba29	
5038	$\langle 2^+ \rangle$		1847	4983	10830(40)	92Ba29		
5300	$\langle 2^+ \rangle$		2067	5242	11089(40)	66Lo06	92Ba29	

Additional data on this isotope can be found in [71Ki06, 70Fi02].

Neutron decay of 2^+ analog resonances in odd-odd compound nuclei ^{92}Nb, ^{96}Tc and ^{98}Tc was studied in [71Ki06].

Presented parameters of IAS were observed in (^{3}He,d) reaction and correspond to the expected parameters of the proton resonances (seven IAS were reported in ENSDF starting with the low-lying 0^+ state at E^*=9008 keV).

S_{pp} and S_{dp} are the spectroscopic factors from the proton scattering and (d,p) reaction, respectively.

For neighbouring nucleus ^{90}Nb the evaluation ENSDF [92Ek02] gives E^*=5008 keV probably corresponding to the expected proton energy $E_\circ$ (in laboratory frame) of IAS resonance with $J^\pi=0^+$ [81FuZV]. This value could be used according to the relation $S_p + (89/90)E_\circ = E^*$ for the estimations of E_{cm}=4952(10) keV and E^*=10029(10) keV.

Target isotope: $^{92}_{40}$Zr $I^{\pi}_{\circ} = 0^+$ *Abundance:* 17.15(8) % $S_p = 6043.1(16)$ keV

$^{93}_{41}$Nb(p)

$E_\circ$ [keV]	$2J^\pi$	$\Gamma_{p_\circ}$ [keV]	Γ_{p_1} [keV]	Γ_{p_2} [keV]	Γ_{p_3} [keV]	Γ_{p_4} [keV]	Γ [keV]	E^*_{analog} [keV]	S_{pp}	S_{dp}	E_{cm} [keV]	E^* [keV]	Ref.		
5065	5^+	3.0(5)					13(5)*	0.0			5011	11054	69Wi15	66Lo06	69ClZZ
6060	1^+	45					73	947	0.54	0.91	5995	12038	65Ro23	70Ke02	
6590	3^+	8.0(8)	5.2(15)		0.72(2)	1.8(4)	38(3)	1425**	0.17	0.38	6519	12562	66Lo06	69Wi15	69ClZZ
7085	1^+	10(1)		3.5(11)		0.45(22)	42(3)	1909**	0.09	0.21	7009	13052	70Ke02	66Lo06	
7640	3^+	$\langle 20 \rangle$			3.9(5)		68(5)	2458**		0.24	7558	13601	69ClZZ	69Wi15	66Lo06
7680	3^+	$\langle x \rangle$	3.0(6)				45(3)	2531			7597	13641	70Ke02		
7940	3^+	14.0(4)	5.4(18)	1.8(3)	3.3(7)	0.7(3)	63(3)	2770	0.15	0.21	7855	13898	69Wi15	66Lo06	69ClZZ
8195		1.1(3)					30(3)	3077	0.24	0.30	8107	14150	70Ke02		

(continued) $^{93}_{41}\mathbf{Nb}(\mathrm{p})$

$E_\circ$ [keV]	$2J^\pi$	$\Gamma_{p_\circ}$ [keV]	Γ_{p_1} [keV]	Γ_{p_2} [keV]	Γ_{p_3} [keV]	Γ_{p_4} [keV]	Γ [keV]	E^*_{analog} [keV]	S_{pp}	S_{dp}	E_{cm} [keV]	E^* [keV]	Ref.	
8470	5^+	<2.0		>8.0			51(5)*	3391		0.028	8379	14422	69El0A	
8585	7^-	2.0(3)		1.0(5)		14.2	43(7)	3421		0.117	8493	14536	70Ke02	69El0A

Additional data on this isotope can be found in [97Ba13, 85Fl01, 79Fl07, 79Mi08, 74Cu04, 73Gr08, 70Ke02, 69El0A, 68Th07].

* Γ=36.7 keV and Γ=30 keV are given in [72Co21] and [69El0A].

** E_{cm}=6510, 7040 and 7580 keV are given in [66Lo06],close to them $E_\circ$ values are given in [69El0A].

$E_\circ$ for all resonances from [70Ke02] are used for the calculation of E_{cm} and E^*.

E_{res}=5070($2J^\pi$=1^+), 6530(3^+), 7600(3^+) and 7880 keV (3^+) were given in [69Wi15] without direct reference to the frame used.

S_{pp} and S_{dp} are the spectroscopic factors from the proton scattering and (d,p) reaction, respectively.

Additional correction of 60 keV was applied in [97Ba13] for the energies given here.

Target isotope: $^{94}_{40}$Zr $I^{\pi}_{\circ} = 0^+$ *Abundance:* 17.38(28) % $S_{\rm p} = 6805.1(20)$ keV

$^{95}_{41}$Nb(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	$\Gamma_{\rm p}$ [keV]	$\Gamma_\circ$ [keV]	$E^*_{\rm analog}$ [keV]	$E_{\rm cm}$ [keV]	E^* [keV]	Ref.			
5240	5^+		2	8	0.0	5185*	11990	66Lo06	69Wi15	79Mi08	93Bu08
6111	1^+				954	6047	12852(9)	70Li22	93Bu08		
6538	$\langle 5^+\rangle$		20	50	1324	6469	13274(5)	70Li22	69Wi15	69ClZZ	
6868	3^+		6	25	1618	6796	13601(6)	70Li22	69Wi15	69ClZZ	
6960	7^+9^+					6885	13690	93Bu08			
6989	5^+				1722	6916	13721(6)	70Li22	83Lu03	93Bu08	
7193	$\langle 5^+\rangle$				$\langle 1940\rangle$	7117	13922(6)	70Li22	83Lu03	93Bu08	
7340	9^-,11^-				2025	7265	14070	93Bu08			
7536					2285	7457	14262(10)	70Li22	83Lu03	93Bu08	
7576	$\langle 3^+\rangle$				2317	7496	14301(10)	70Li22	83Lu03	93Bu08	
7640	$\langle 3^+\rangle$				2372	7560*	14365(7)	70Li22	83Lu03	93Bu08	66Lo06
7732	$\langle 7^+$,$9^+\rangle$				2464	7651	14456(10)	70Li22	83Lu03	93Bu08	
7910	3^+				2638	7825	14630(11)	70Li22	83Lu03	93Bu08	
8011	$\langle 7\rangle^+$				2732	7927	14732(10)	70Li22	83Lu03	93Bu08	
8112					2834	8027	14832(12)	70Li22	83Lu03	93Bu08	
8260	$\langle 3^+\rangle$				2983	8173	14978(6)	70Li22	83Lu03	93Bu08	
8288	$\langle 3^+\rangle$				3012	8201	15006(6)	70Li22	83Lu03	93Bu08	
8340	$\langle 7^-\rangle$				3062	8252	15057(12)	70Li22	83Lu03	93Bu08	

Additional data on this isotope can be found in [83Lu03, 79Mi08, 70Li09, 69Ha23].

* These $E_{\rm cm}$ were used in the calculation of Coulomb displacement energies in [66Lo06].

$E_{\rm res}$=5210($2J^\pi$=5^+), 6870(3^+) and 7590 keV (3^+) were given in [69Wi15] without reference to the frame.

We admit the possibility of the additional corrections of the order 60 keV for the energies given here.

Target isotope: $^{96}_{40}$Zr $I^{\pi}_{\circ} = 0^+$ *Abundance:* 2.80(9) % $S_{\rm p} = 7455.3(32)$ keV

$^{97}_{41}$Nb(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	$\Gamma_{\rm p}$ [keV]	$\Gamma_\circ$ [keV]	$E^*_{\rm analog}$ [keV]	$E_{\rm cm}$ [keV]	E^* [keV]	Ref.	
6063	$\langle 1^+\rangle$				0.0	6000	13455	66Lo06	
7047*	3^+				1103	6975(30)*	14430(30)	66Lo06	93Ar09
7270*	7^+				1264	7195(30)*	14650(30)		93Ar09
8270*	11^-				2265	8185(30)*	15640(30)		93Ar09

* These expected parameters of IAR (Isobar Analog Resonances) in (p,γ), (p,p) or (p,n)-reactions are derived from the analysis of data from (^{3}He,d)-reaction measurements.

Isobar analog resonances are superimposed on Giant Dipole Resonance at E^*=16500 keV with Γ=4000 keV.