^{163}Hf $Z = 72$ $N = 91$ adopted link ENSDF link

Based on ensdf_240402 (Apr 2024), and mass evaluation from 2020

BE = 1308.565 (0.026) MeV
Qbeta+ = 5.522 (0.038) MeV

	Energy	T	J+	J-	J-other	T1/2
S-alpha= -4.139 (0.031)						
163HF 1				0.000 (5/2-)	1	40.0 S 6
163HF 2				0.107 (9/2-)	2	
163HF 3	0.151		(13/2+)		3	
163HF 4	0.406		(17/2+)		4	103 PS 8
163HF 5				0.457 (13/2-)	5	
163HF 6	0.841		(21/2+)		6	
163HF 7				0.953 (17/2-)	7	
163HF 8	1.144		(19/2+)		8	
163HF 9	1.150		(17/2+)		9	
163HF 10	1.405		(25/2+)		10	
163HF 11				1.538 (21/2-)	11	
163HF 12	1.549		(21/2+)		12	
163HF 13	1.613		(17/2+)		13	
163HF 14				1.630 (21/2-)	14	
163HF 15	1.710		(23/2+)		15	
163HF 16	1.759		(19/2+)		16	
163HF 17	1.933		(21/2+)		17	
163HF 18				1.969 (23/2-)	18	
163HF 19	2.007		(25/2+)		19	
163HF 20				2.019 (25/2-)	20	
163HF 21	2.063		(29/2+)		21	
163HF 22				2.139 (25/2-)	22	
163HF 23	2.139		(23/2+)		23	
163HF 24	2.225		(25/2+)		24	
163HF 25				2.323 (27/2-)	25	
163HF 26	2.325		(25/2+)		26	
163HF 27				2.488 (29/2-)	27	
163HF 28				2.493 (27/2-)	28	
163HF 29	2.543		(29/2+)		29	
163HF 30				2.556 (29/2-)	30	
163HF 31	2.615		(27/2+)		31	
163HF 32				2.664 (31/2-)	32	
163HF 33	2.749		(29/2+)		33	
163HF 34	2.793		(33/2+)		34	
163HF 35	2.878		(29/2+)		35	

```
163HF  36 |                   |   2.916     (31/2-)|                   36
163HF  37 |                   |   2.921     (33/2-)|                   37
163HF  38 |                   |   3.093     (33/2-)|                   38
163HF  39 |                   |   3.133     (35/2-)|                   39
163HF  40 |  3.143     (33/2+)|                    |                   40
-----------                                                           -----------------
163HF  41 |  3.221     (31/2+)|                    |                   41
163HF  42 |  3.321     (33/2+)|                    |                   42
163HF  43 |                   |   3.434     (37/2-)|                   43
163HF  44 |                   |   3.443     (35/2-)|                   44
163HF  45 |  3.556     (37/2+)|                    |                   45
163HF  46 |  3.567     (33/2+)|                    |                   46
163HF  47 |                   |   3.683     (37/2-)|                   47
S-p    =   3.727 ( 0.079) ---------------------------------------------------------------
163HF  48 |                   |   3.734     (39/2-)|                   48
163HF  49 |  3.796     (37/2+)|                    |                   49
163HF  50 |                   |   3.856     (35/2-)|                   50
-----------                                                           -----------------
163HF  51 |  3.937     (37/2+)|                    |                   51
163HF  52 |  3.941     (35/2+)|                    |                   52
163HF  53 |                   |   4.053     (41/2-)|                   53
163HF  54 |                   |   4.055     (39/2-)|                   54
163HF  55 |  4.271     (41/2+)|                    |                   55
163HF  56 |                   |   4.329     (41/2-)|                   56
163HF  57 |  4.370     (37/2+)|                    |                   57
163HF  58 |                   |   4.408     (39/2-)|                   58
163HF  59 |                   |   4.443     (43/2-)|                   59
163HF  60 |  4.536     (41/2+)|                    |                   60
-----------                                                           -----------------
163HF  61 |  4.634     (41/2+)|                    |                   61
163HF  62 |  4.720     (39/2+)|                    |                   62
163HF  63 |                   |   4.753     (43/2-)|                   63
163HF  64 |                   |   4.782     (45/2-)|                   64
163HF  65 |  4.964     (45/2+)|                    |                   65
163HF  66 |                   |   5.000     (43/2-)|                   66
163HF  67 |                   |   5.093     (45/2-)|                   67
163HF  68 |  5.104     (41/2+)|                    |                   68
163HF  69 |                   |                    |   5.207           69
163HF  70 |                   |   5.232     (47/2-)|                   70
-----------                                                           -----------------
163HF  71 |  5.292     (45/2+)|                    |                   71
163HF  72 |  5.336     (45/2+)|                    |                   72
163HF  73 |                   |   5.495     (47/2-)|                   73
163HF  74 |                   |   5.597     (49/2-)|                   74
163HF  75 |                   |   5.668     (47/2-)|                   75
163HF  76 |  5.705     (49/2+)|                    |                   76
163HF  77 |                   |   5.888     (49/2-)|                   77
163HF  78 |                   |   5.989     (49/2-)|                   78
163HF  79 |  6.011     (49/2+)|                    |                   79
S-2p   =   6.013 ( 0.030) ---------------------------------------------------------------
```

```
163HF  80 |                   |   6.096     (51/2-)|                   80
-----------                                                            -----------------
163HF  81 |                   |   6.258     (51/2-)|                   81
163HF  82 |                   |   6.380     (51/2-)|                   82
163HF  83 |                   |   6.485     (53/2-)|                   83
163HF  84 |  6.511     (53/2+)|                    |                   84
163HF  85 |                   |   6.594     (53/2-)|                   85
163HF  86 |                   |   6.985     (55/2-)|                   86
163HF  87 |                   |   7.059     (55/2-)|                   87
163HF  88 |                   |   7.156     (55/2-)|                   88
163HF  89 |                   |   7.314     (57/2-)|                   89
163HF  90 |  7.385     (57/2+)|                    |                   90
-----------                                                            -----------------
163HF  91 |                   |   7.453     (57/2-)|                   91
163HF  92 |                   |   7.812     (59/2-)|                   92
163HF  93 |                   |   7.998     (59/2-)|                   93
163HF  94 |                   |   8.036     (59/2-)|                   94
163HF  95 |                   |   8.134     (61/2-)|                   95
S-n    =   8.172 ( 0.027) ------------------------------------------------------------
163HF  96 |  8.322     (61/2+)|                    |                   96
163HF  97 |  8.360     (61/2+)|                    |                   97
163HF  98 |                   |   8.451     (61/2-)|                   98
163HF  99 |                   |   8.690     (63/2-)|                   99
163HF 100 |                   |   8.903     (63/2-)|                  100
-----------                                                            -----------------
163HF 101 |                   |   9.018     (65/2-)|                  101
163HF 102 |  9.172     (65/2+)|                    |                  102
163HF 103 |  9.326     (65/2+)|                    |                  103
163HF 104 |                   |   9.623     (67/2-)|                  104
163HF 105 |                   |   9.980     (69/2-)|                  105
163HF 106 | 10.051     (69/2+)|                    |                  106
163HF 107 |                   |  10.609     (71/2-)|                  107
163HF 108 | 10.986     (73/2+)|                    |                  108
163HF 109 |                   |  11.012     (73/2-)|                  109
163HF 110 | 11.972     (77/2+)|                    |                  110


S-p    =   3.727 ( 0.079) ------------------------------------------------------------
S-n    =   8.172 ( 0.027) ------------------------------------------------------------
S-2p   =   6.013 ( 0.030) ------------------------------------------------------------
S-2n   =  19.096 ( 0.035) ------------------------------------------------------------
S-alpha=  -4.139 ( 0.031) ------------------------------------------------------------

S+p       =  -1.302 ( 0.038)
S+n       = -10.620 ( 0.030)
S+2p      =  -4.170 ( 0.036)
S+2n      = -18.509 ( 0.038)
S+alpha   =   4.751 ( 0.032)

gap p     =   2.424 ( 0.088)
```

```
gap n     =  -2.448 ( 0.041)
gap 2p    =   1.843 ( 0.047)
gap 2n    =   0.588 ( 0.051)
gap alpha =   0.612 ( 0.044)
```