# PHENOMENOLOGICAL SHELL-MODEL SPACES

| Orbit | n | l | j | m | Parity | Degeneracy | Max fill |
|---|---|---|---|---|---|---|---|
| $0s_{1/2}$ | 1 | 0 | 1/2 | 1/2, -1/2 | + | 2 | 2* |
| $1p_{3/2}$ | 1 | 1 | 3/2 | 3/2,...,-3/2 | - | 4 | 6 |
| $1p_{1/2}$ | 1 | 1 | 1/2 | 1/2, -1/2 | - | 2 | 8* |
| $1d_{5/2}$ | 1 | 2 | 5/2 | 5/2,...,-5/2 | + | 6 | 14 |
| $2s_{1/2}$ | 2 | 0 | 1/2 | 1/2, -1/2 | + | 2 | 16 |
| $1d_{3/2}$ | 1 | 2 | 3/2 | 3/2,...,-3/2 | + | 4 | 20* |
| $1f_{7/2}$ | 1 | 3 | 7/2 | 7/2,...,-7/2 | - | 8 | 28* |
| $2p_{3/2}$ | 2 | 1 | 3/2 | 3/2,...,-3/2 | - | 4 | 32 |
| $1f_{5/2}$ | 1 | 3 | 5/2 | 5/2,...,-5/2 | - | 6 | 38 |
| $2p_{1/2}$ | 2 | 1 | 1/2 | 1/2, -1/2 | - | 2 | 40 |
| $1g_{9/2}$ | 1 | 4 | 9/2 | 9/2,...,-9/2 | + | 10 | 50* |

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|---|---|
| Model space | $0d_{3/2},\ 0d_{5/2},\ 1s_{1/2}$ |
| .int | usdb |
| .spo | sd |
| $Z_0 = N_0$ | 8 |
| Core | $^{16}$O |
| Max occ. | 12 |
| Largest nucleus | $^{40}$Ca |
| xspe, A, B, X | 1.0 18.0 A 0.3 |
| Single particle orbits (3): | |

| $n$ | $l$ | $\pi$ | $j$ | E (MeV) | max occ. |
|---|---|---|---|---|---|
| 0 | 2 | +1 | 3/2 | 2.1117 | 4 |
| 0 | 2 | +1 | 5/2 | -3.9257 | 6 |
| 1 | 0 | +1 | 1/2 | -3.2079 | 2 |

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|---|---|
| Authors | Brown, Richter (2006) |
| Citation | `https://doi.org/10.1103/PhysRevC.74.034315` |

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|---|---|
| Model space | $0f_{7/2},\ 1p_{3/2},\ 0f_{5/2},\ 1p_{1/2}$ |
| .int | gx1a |
| .spo | fp |
| $Z_0 = N_0$ | 20 |
| Core | $^{40}$Ca |
| Max occ. | 20 |
| Largest nucleus | $^{80}$Zr |
| xspe, A, B, X | 1.0 42.0 A 0.3 |
| Single particle orbits (4): | |

| $n$ | $l$ | $\pi$ | $j$ | E (MeV) | max occ. |
|---|---|---|---|---|---|
| 0 | 3 | -1 | 7/2 | -8.6240 | 8 |
| 1 | 1 | -1 | 3/2 | -5.6793 | 4 |
| 0 | 3 | -1 | 5/2 | -1.3829 | 6 |
| 1 | 1 | -1 | 1/2 | -4.1370 | 2 |

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|---|---|
| Authors | Honma, Otsuka, Brown, Mizusaki (2004) |
| Citation | `https://doi.org/10.1103/PhysRevC.69.034335` |

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|---|---|
| Model space | $0f_{5/2}$, $1p_{3/2}$, $1p_{1/2}$, $0g_{9/2}$ |
| .int | jun45 |
| .spo | jj44 |
| $Z_0 = N_0$ | 28 |
| Core | $^{56}$Ni |
| Max occ. | 22 |
| Largest nucleus | $^{100}$Sn |
| xspe, A, B, X | 1.0 58.0 A 0.3 |
| Single particle orbits (4): | |

| $n$ | $l$ | $\pi$ | $j$ | E (MeV) | max occ. |
|---|---|---|---|---|---|
| 0 | 3 | -1 | 5/2 | -8.7087 | 6 |
| 1 | 1 | -1 | 3/2 | -9.8280 | 4 |
| 1 | 1 | -1 | 1/2 | -7.8388 | 2 |
| 0 | 4 | +1 | 9/5 | -6.2617 | 10 |

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|---|---|
| Author(s) | Honma, Otsuka, Mizusaki, Hjorth-Jensen (2009) |
| Citation | `https://doi.org/10.1103/PhysRevC.80.064323` |

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|---|---|
| Model space | $0g_{7/2}$, $1d_{5/2}$, $1d_{3/2}$, $2s_{1/2}$, $0h_{11/2}$ |
| .int | GCN5082 |
| .spo | GCN5082 |
| $Z_0 = N_0$ | 50 |
| Core | $^{100}$Sn |
| Max occ. | 32 |
| Largest nucleus | $^{164}$Pb |
| xspe, A, B, X | 1.0 1.0 1.0 1.0 |
| Single particle orbits (5): | |

| $n$ | $l$ | $\pi$ | $j$ | x | E (MeV) | max occ. |
|---|---|---|---|---|---|---|
| 0 | 4 | +1 | 7/2 | 4 | -10.416450 | 8 |
| 1 | 2 | +1 | 5/2 | 4 | -10.602300 | 6 |
| 1 | 2 | +1 | 3/2 | 4 | -8.915810 | 4 |
| 2 | 0 | +1 | 1/2 | 4 | -9.057190 | 2 |
| 0 | 5 | -1 | 11/2 | 5 | -8.205680 | 12 |

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| Author(s) | |
| Citation | Unpublished. |