R-Matrix Approaches to Isospin and Mirror Symmetry

CARL BRUNE, Ohio University — R-matrix theory may utilized to relate partial widths or asymptotic normalization constants in one nucleus to the corresponding quantities for states in other nuclei that are related by isospin or mirror symmetry. Specific methods of implementing these relationships will be reviewed and applied to s-wave mirror levels in nucleon+\(^{12}\)C, nucleon+\(^{16}\)O, and nucleon+\(^{26}\)Al. Particular attention is paid to effects arising from beyond the nuclear surface, where isospin symmetry is strongly violated. Finally, a new approach to multi-level mirror symmetry is derived and applied to the first three \(2^+\) states of \(^{18}\)O and \(^{18}\)Ne. In this case, significant deviations from naive mirror symmetry are found, due to external mixing of the levels.

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