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A transition centric approach to automatic level scheme determination GREG DEMAND, PAUL GARRETT, University of Guelph, JIM WADDINGTON, McMaster University — Powerful γ-ray spectrometers are capable of rapidly collecting large data sets that incorporate hundreds of transitions. The determination of nuclear level schemes from the resulting experimental data is time consuming and is a substantial obstacle to the rapid development and formulation of new ideas, particularly when examining trends amongst large numbers of nuclei. This presentation will introduce a new transition-centric framework for level scheme determination. Using a transition-centric level scheme representation that closely matches the form of the experimental data allows for the derivation of an analytical formula that directly relates experimental data to level scheme structure. This approach transforms level scheme determination into a moderately complicated optimization problem. These developments, in combination with a simulated annealing optimization algorithm will be used to demonstrate the automatic determination of a level scheme derived from simulated $^{152}\mathrm{Eu}^{g}$ β^{+}/EC decay data.

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