Symplectic Spectrum Generating Algebra for three-body models

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The sp(4) Lie algebra is used as a spectrum generating algebra for a large class of three-body quantum hamiltonians that can be constructed with its ten elements. The physical operators that are built with coordinates and conjugate momenta of two particles are mapped into step and weight operators of sp(4). These are in turn mapped to suitable 4-modes bosonic operators that are used to find matrix elements by generalizing a method of Wybourne. This allows the diagonalization of important three-body models in which two particles, each confined by its own potential, are allowed to interact with each other. We shall give a few examples.