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Title: Symbolic programming package `\textit{NCoperators}` with applications in atomic physics

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A symbolic programming package `\textit{NCoperators}` written on `\textit{Mathematica}` is presented. The package contains three main blocks: Angular Momentum Theory (AMT), Second Quantization Representation (SQR), Rayleigh--Schrödinger Perturbation Theory (RSPT). The latter is applied up to the third-order, so far. In atomic many-body theories, based on group-theoretic methods, the calculation of many-body matrix elements of irreducible tensor operators is a troublesome task due to the sums of Clebsch--Gordan coefficients that arise. Therefore, some computer algebra assistance is appreciated. The package `\textit{NCoperators}` is exactly what we need to solve such kind of tasks as well as many other. The specific feature of the present package is that the generation of various expressions is performed in the same way as if it were done by hand. The advantage is an avoidance of accidental errors and a possibility to export obtained expressions to `\LaTeX`. Moreover, various sum simplifications and useful rules are implemented to simplify large and complicated expressions as much as it is possible. The application of `\textit{NCoperators}` to some particular atomic many-body problems one can find, for example, in [1]-[2]. References [1] R. Jursenas, G. Merkelis, Cent. Eur. J. Phys. **9**, no. 3, 751 (2011) [2] R. Jursenas, G. Merkelis, J. Math. Phys. **51**, 123512 (2010)