

From second quantization to the statistical modeling of complex atomic spectra

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The adaptation of the second quantization method to atomic physics by B. Judd made it possible to calculate multiple summations over angular momenta, by expressing these sums as traces of operator products. This led C. Bauche-Arnoult, J. Bauche and M. Klapisch to develop statistical models for the distributions of quantum numbers (J, M) and spectral lines (E1, E2, ...). In this presentation, we recall the main features of the associated formalisms, which opened the way to the calculation of radiative properties of hot plasmas made of multicharged ions and evoke recent advances which would not have been possible without these seminal works.