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The effect of correlation on line strengths in third row elements
CHARLOTTE FROESE FISCHER, Vanderbilt University — A number of strong interactions are present in the third row elements. The well-known two configuration $2s^2 - 2p^2\ {}^1S$ interaction in Be I becomes a three configuration $3s^2 - 3p^2 - 3d^2\ {}^1S$ interaction in the third row. For this row, there also is a strong $3s3d - 3p^2\ {}^1D$ interaction in many $3s^2 3p^n 3d$ LS or $3s3p^{n+2}$ LS states. The effect of this interaction is to introduce severe cancellation in the calculation of oscillator strengths for some states and enhancement in others when compared with Hartree-Fock values. In neutral atoms, the $3s^3p^{n+2}$ LS state often is in the continuum but already in the singly ionized element of the iso-electronic sequence both states are observed. Cancellation occurs in line strengths of the lower states which may explain the presence of some excited levels and absence of lower levels in some spectra for highly ionized elements where level identification is less complete. Results will be presented for several isoelectronic sequences.

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