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**Sinopsis**

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This book presents a comprehensive overview of the modern theory of spectral line broadening and shifting by pressure of atmospheric gases. It describes current semi-classical methods for calculating vibrotational line widths and shifts, including very recent modifications and new developments realised by the authors themselves. For most of the considered molecular systems, analytical formulae are also given, which enable the calculation of line broadening coefficients without the use of semi-classical methods. The results of calculations by various approaches are compared with experimental data available in the literature. Numerous appendices list theoretical expressions and parameters' values required for the writing of computer programs for calculation of line broadening and line shifting coefficients.

The book is addressed to undergraduate and postgraduate students as well as to professional scientists and researchers working in the field of molecular physics, molecular spectroscopy, quantum chemistry and mathematical physics.