



Collisional absorption shapes and atmospheric spectra

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Recent results concerning the modeling of collisional effects on infrared absorption shapes of molecular spectra will be presented. These include laboratory measurements for various species made over large ranges of pressure and temperature as well as the development of theoretical approaches. The latter account for the effects of pressure (of collisions) by using the impact approximation and account for the transfers of populations among rotational levels induced by collisions. Test using measured spectra demonstrate the quality of the proposed approaches and the failure of the usual line profile (Voigt/Lorentz). Indeed, the latter, which can lead to significant errors close to line centers, also stringly overestimates absorption in the line and band wings. These results are confirmed when atmospheric spectra are considered demonstrating that their analysis and treatment requires the use of proper spectral shapes and, in some cases, the inclusion of collision indiced absorption processes. A number of illustrating examples will be given in the cases of the atmospheres of the Earth, mars, Jupiter, and Saturn, for the absorption by N_2O , CO_2 , CH_4 , and O_2