A MULTISPECTRUM NONLINEAR LEAST SQUARES FITTING TECHNIQUE: ZERO LEVEL OFFSETS

D. CHRIS BENNER, *Department of Physics, The College of William and Mary, Box 8795, Williamsburg, VA 23187-8795.*

Lack of knowledge of a spectrum's zero level can be a major source of uncertainty in the analysis of laboratory spectra. Particularly affected are the spectral line intensities and parameters strongly correlated with the spectral line intensities. Nonlinear least squares fitting of a single spectrum at a time offers no means of overcoming these correlations unless there is a completely saturated spectral line in or near the fitted spectral interval or else there is independent experimental information concerning the zero level offset or intensities of the spectral lines. In the cases in which a single spectrum analysis cannot resolve these problems, the multispectrum nonlinear least squares fitting technique can sometimes account for the zero level offset by reliance upon information contained in other spectra in the solution. If one or more spectra have well determined zero level offsets and appropriate physical conditions in the absorption cell, it is often possible to solve for the offsets in the remaining spectra. The result is an internally consistent set of spectral line intensities.