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Optimizing extraction of information from resonance lines in Fourier-transform infrared spectroscopy P. AGGARWAL, Duke, D.E. ASPNES, NCSU — The major analytic challenge in spectroscopy is to extract the maximum amount of information from an optical feature or features that are usually defined by a small number of data points. These in turn are often adversely influenced by both noise and the resolution function of the spectrometer. In dispersive-optical data the optimal approach for analyzing individual or closely spaced features is to Fourier-transform them and perform the analysis in reciprocal space, a procedure that requires the removal of endpoint-discontinuity artifacts. In Fourier-transform infrared spectroscopy (FTIR) the situation is more complicated in that the interferogram is measured and the spectrum calculated by Fourier analysis. We show that endpoint-discontinuity considerations provide insight into the effects of apodization on the Fourier transform of the interferogram. Once these effects are taken into account, individual structures can be analyzed as in the dispersive-optics case.

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