Spectral Analysis of Time-Series Data, by
Rebecca M. Warner, New York: Guilford Press, 1998,

Recently, while doing my own research for some application that I was pursing, I discovered that Technometrics had provided no reviews or reports for any books on spectral analysis during my entire 18-year tenure. So I checked on Amazon.com and found that I had missed a few. I requested a couple of the more recent ones. There have been no new ones for the past few years.

This book was hardly the type of spectral analysis book that I had expected. I learned spectral analysis from the text by Jenkins and Watts (1968), whose two authors were both exceptional mathematicians, which was clearly reflected in their book. Studying spectral analysis always meant dealing with a lot of complex mathematics. Leafing through this book, one will see hardly any equations. In fact, this book presents mostly text. However, that certainly does not diminish its value. Professor Warner has simply devoted an entire book to explaining how to do and use spectral analysis.

The book is focused on sociological, physiological, and psychological data. The first two chapters are concerned with planning the studies that will provide the data. A chapter on preliminary analysis (plotting, trend analysis, trend removal) is followed by three chapters that present the basic tools in frequency-domain time series analysis. The topics are harmonic analysis, periodogram analysis, and spectral analysis. Chapter 7 summarizes the analysis process and deals with the simultaneous consideration of several different time series. Multivariable time series are limited to the bivariate case, which is the topic for the next three chapters. Here lagged relationships, serial dependence, and cross-spectral analysis are the primary topics. The book concludes with one practical chapter, “Pitfalls for the Unwary,” and a chapter on “Theoretical Issues.”

The analysis of the applications uses the TRENDS program in SPSS. The soft-science focus does not detract from the comprehensive explanations of the practical application of spectral methods. This book is an excellent companion to the more typical, more theoretical book (see, e.g., Stoica and Moses 1997). Curiously, there are no newer comprehensive books on spectral analysis. Those listed in Amazon.com, which are newer, are all specific to a particular application, such as instrumentation, physics, or communication.

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