Monitoring the Comprehensive Nuclear-Test-Ban Treaty: Source Location, edited by Frode Ringdal and Brian L. N. Kennett. Birkhäuser Verlag Basel-Boston-Berlin, 2001, Reprint from Pure and Applied Geophysics (PAGEOPH), Volume 158 (2001), No.1/2, 428 pages.

This Topical Volume of PAGEOPH contains a collection of twenty research papers focusing on the improvement of the location accuracy of seismic events using data recorded by regional and global networks of seismic stations, especially by those of the International Monitoring System (IMS) operated in context with the Comprehensive Nuclear-Test-Ban Treaty (CTBT), on advances in the methodology of locating seismic sources in complex media, and on the results of recent large-scale international regional location calibration efforts. The authors of the individual papers are recognized American, Australian, German, Israeli, Italian, Norwegian, Kazakh and Russian seismologists and experts in the field of detection, location and identification of low-magnitude seismic events.

The topics the authors discuss include, in the order in which they appear in the volume, the technical background and the requirements for seismic event location in the CTBT context; seismic event location techniques and location calibration procedures currently employed in the prototype International Data Centre Arlington, Virginia, USA; improvement of the location accuracy by source-specific corrections; regional travel-times for North America and Northern Eurasia and application of 3-D modeling techniques for deriving accurate travel-time corrections for North America; development, validation and application of regional (Wyoming, European Arctic, Norway) models improving location estimates; development of improved regional travel-time curves for the Semipalatinsk test site area from calibration explosion data; use of a master-event technique to obtain accurate location estimates for this area using IMS data; new algorithm providing robust location estimates and reducing the computational load compared to other nonlinear inversion techniques; location algorithm which uses data recorded by a network of three-component stations and applies an adaptive, migrating grid search technique; enhancement of conventional location method by means of travel-time differences between different seismic phases observed at the same station; and employment of three-dimensional mantle P-wave velocity models or of empirical heterogeneity corrections to improve the location accuracy for teleseismic events.

Brian J. Mitchell's preface and the following introduction by the two editors of the volume give even the lay reader a fair overview of the history of the CTBT research program, of the fundamentals of employed data treatment methods, and of major cooperative research works hitherto conducted within the program. The other contributions are intended rather for specialists in the respective fields. The average Studia geophysica et geodaetica reader will therefore hardly want to purchase the volume or read it in its entirety. The volume however can be very useful to researchers dealing with the improvement of routine seismic data processing procedures, the refinement or construction of seismic velocity models, and the enhancement of seismic event location accuracy in a regional scale, for instance within a national seismic network. Purchase of the Birkhäuser reprint will be the best alternative for observatory or data centre seismologists who are interested in these subjects but don't have quick access to the original PAGEOPH issue.

The volume is the first of an intended series of special issues on monitoring the CTBT. Topics to appear in later issues are Hydroacoustics, Surface Waves, Source Processes and Explosion Yield Estimation, Regional Wave Propagation and Crustal Structure, Infrasound, Source Discrimination, and Data Processing.

June 6, 2001

Axel Plešinger
Prague, Czech Republic