CREWES software release

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ABSTRACT

This paper gives a brief overview of the contents of the November 1993 CREWES Project software release. For detailed information, please refer to the documentation enclosed in the actual release.

NOVEMBER 1993 SOFTWARE RELEASE

PP, PS and SS Offset Stack Synthetic Seismograms

This program is based on raytracing of flat layers. Raytracing is based on the bisection method for solving the ray parameter. Reflection coefficients are computed using the Zoeppritz formulae of Aki and Richards, as coded by E.S. Krebes. Synthetic seismograms are created by stacking NMO-corrected traces over a range of offsets

This program is an new release of the synthetics package originally released in March of 1992. There have been several significant upgrades made in this version. There is now a Motif-like graphical user interface, allowing the creation and editing of parameter files used to control the modelling program. There is a new NMO option, the pseudo-zero offset NMO stack, and a new mute option, allowing for muting based on stretch.

3-D Converted Wave Asymptotic Binning

The program accepts orthogonal horizontal motion seismic traces. It performs 3-D asymptotic common conversion point binning of these traces. It also rotates the data into radial and transverse components, from shot to receiver. Input and output files are ITA format. See chapter 29 of this CREWES report, "3-D converted wave asymptotic binning", by Mark C. Lane and Don C. Lawton.

Body Wave Synthetic Seismograms Using the Goupillaud Model

This program generates a synthetic seismogram resulting from plane waves traveling through a sequence of horizontal layers. The seismogram contains direct and multiply reflected P and S body waves. The Goupillaud method allows the simulation of wave propagation in very densely layered media, with fast run-times. See chapter 14 of this CREWES report, "Synthetic seismograms for P and S waves using the Goupillaud model", by Donald T. Easley and Darren S. Foltinek.

Postscript Plotting Package

This package allows Postscript files to plotted on black and white or color Versatec plotters. Poster-sized output can be produced on large-format plotters. The software can also be used to create color printouts on wax transfer plotters such as the

Versatec C2800. The software consists of the GNU ghostscript package for rasterizing Postscript, as well as software for generating color separations. A plotter control program is included for directing output to the plotter.

SEG-2 to SEG-Y File Conversion

The utility translates data files in the new SEG-2 format into the older but more common SEG-Y format. Unlike the version published by the SEG (Bennett, 1990), this version compiles and runs on most Unix systems. It supports all SEG-2 and SEG-Y data types.

SEG-Y Format Conversion

CVTSGY and DUMPSGY are utilities that allow the translation and viewing of SEG-Y data files in different, machine dependent formats. This release contains new features and fixes some known bugs. Previous versions of cvtsgy and dumpsgy were released in the March and November 1992 software releases. For a complete discussion of the different formats, see chapter 10 of this CREWES report, "Rationalizing varying seismic data formats", by Henry C. Bland.

Matlab Output to ITA File

Matlab is a commercial software package that is ideal for vector or matrix computations. We provide a Matlab function that writes out a matrix as a single record ITA format data file.

DISTRIBUTION AND COPYRIGHT

Software Distribution

Included in the software released to every sponsor is a 3 1/2" diskette and a printed manual. This diskette contains software developed by the CREWES Project. The Postscript plotting package requires two freely distributable software packages which, because of their size, must be distributed on tape. Included in the software release is a form which we ask be filled out and returned to us specifying the required tape format.

To obtain a copy of the release for your personal use, please see the CREWES Project representative within your organization.

Software Copyright

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Software and documentation is provided in good faith, and is believed to work to the best of our knowledge. However, all programs are experimental, and come with no warranty. They are not guaranteed to work at all.

For permission to distribute this software, or to report any problems or bugs, please contact the CREWES Project:

Software Release
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SUMMARY

The CREWES Project software release is provided with the hope that it is an effective means of technology transfer to our sponsors that complements the research report. Please let us know if you have any questions or comments on this or any other software release.

REFERENCES

Lane, Mark C., Lawton, Don C., 1993, 3-D converted wave asymptotic binning:, CREWES Research Report, v. 5, ch. 29

Easley, Donald T., Foltinek, Darren S., 1993, Synthetic seismograms for P and S waves using the Goupillaud model:, CREWES Research Report, v. 5, ch. 14

Bland, Henry C., 1993, Rationalizing varying seismic data formats:, CREWES Research Report, v.5, ch. 10

Bennett, Brent, 1990, A computer program to convert SEG-2 data to SEG-Y:, Geophysics, 55, 1273-1284