CREWES software release

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ABSTRACT

This paper gives a brief overview of the contents of the December 1994 CREWES Project software release.

OVERVIEW

In the course of performing our research, we find it necessary to write programs to test new ideas and to solve new kinds of problems. Our goal is to deliver not only the results of our work in the form of a research report, but also a software release. This release lets sponsors obtain implemented examples of new algorithms. It should be noted, that all the code we release is prototype code. Our goal is not to produce polished, commercial, software products, but to create test programs. That being said, we are pleasantly surprised that this latest release contains a number of programs that are close to being of commercial quality. Sponsor companies who wish to use these programs in a production environment are still advised to study the code carefully, understand how it works, and perform a significant amount of testing. Some utility programs are also included in the release.

This document only servers to advertise the presence of the software release. Full documentation for the programs is packaged with the software release tape. An envelope containing a tape and the full documentation was distributed at the 1994 sponsors meeting at Kananaskis Lodge. Sponsors can request an additional copy of the release by contacting the CREWES Project:

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RELEASE CONTENTS

Synth

The Synth program performs PP, PS and SS offset stack synthetic seismogram generation. It is based on raytracing of flat layers using 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 version has been enhanced to allow wavelets to be imported. A problem with reading log files beginning with numbers has also been fixed in this release.

P-SV inversion

This program estimates S-wave velocity logs from pre-stack converted - wave (P-S) seismic data. This P-SV inversion technique requires converted-wave CCP gathers, a P-wave sonic log, and a P-wave macro velocity model. A band - limited S-wave sonic log section and a relative change in S-wave velocity section are produced.

This implementation utilizes the ProMAX processing system.and is written as a standard ProMAX process. The algorithm is described in chapter 8 of this research report, (Ferguson et. al., 1994).

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.

This program was released previously as a stand-alone program that utilized ITA/Insight I/O conventions. This new version has been written as a ProMAX process (Lane, 1994).

asciitosgy - ASCII to SEG-Y utility

This program converts a file containing sample values, written as text, into a SEG-Y format seismic dataset. The program is very simple, but it has been found useful for ad-hoc generation of SEG-Y files.

convsegy - SEG-Y conversion utility

This program converts between different SEG-Y variants. The code originated as the program "cvtsgy" which has been released in previous years. This is a major re-working of the program: the command line interface is greatly simplified, and it now uses a number of heuristics to determine the input file's format. In most cases, no command-line options need to be supplied to convsegy. Given an input file that is a variant of SEG-Y, it outputs a file that is totally conformant to the SEG-Y standard.

d3d3c - 3-D, 3-C survey design program

This program will generates fold maps from arbitrary 3-D, 3-C acquisition parameters. Using the fold map, users can find optimal survey parameters. An earlier version of this program (Lawton, 1993) was included in a previous software release targeted at MS-DOS systems. This version has been ported to UNIX and can be used with one of two interfaces: an X-Window version that uses the Motif user interface, and a unique World Wide Web interface. Further information on the World Wide Web interface can be found in chapter 20 of this research report, (Foltinek, 1994).

CSP gather

This is the prototypical implementation of the pre-stack migration by equivalent offsets and CSP gathers that is described in chapter 27 of this research report. This implementation is written for the ProMAX processing package (Bancroft et. al., 1994).

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 about this or any other software release

REFERENCES

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