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Preface to practical inversion tutorial

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ABSTRACT

My book revisions have lead to three chapters that form a practical inversion tutorial. Included in the tutorial are some new research results, namely (1) antialias velocity estimation, (2) weighting function for separation of pressure and shear waves, (3) properties of interpolation-error filters, and (4) blind deconvolution of an all-pass filter.

Continuing revisions of my first book "Fundamentals of Geophysical Data Processing" are leading me so far from the from the original book that I am contemplating a new title "Dissecting Earth Soundings" and completion in 1991. I am including the three chapters that have undergone the most recent alteration. They happen to be contiguous and could be entitled "Practical inversion tutorial." Much of this material has appeared before in SEP reports, but I felt obliged to include the old with the new, in order to avoid a lack of continuity.

Although the material is billed as being tutorial, it includes some new research results as well as many interesting examples. The new results are:

- Chapter 6. Section 5 describes a new anti-alias method of velocity analysis.
- Chapter 7. This chapter begins by examining the separation of pressure and shear waves. The solution illustrates the importance of choosing an appropriate weighting function in any inversion scheme.
- Chapter 8. The whole chapter is new. The hoary conclusion that blind deconvolution cannot find an all-pass filter is shown to be invalid, and an estimation method based on interpolation-error (IE) filters is given and demonstrated. It seems to be a new result that IE filters invert the spectrum of their input and a new recognition that IE filters can play a significant role in determining an appropriate weighting in inversion problems.

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REFERENCES

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