Reply to comment by M. D. Sacchi and T. J. Ulrych on
'Simultaneous time-domain deconvolution with application to the computation of receiver functions'

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We thank Sacchi & Ulrych (1996; hereafter referred to as SU96) for bringing to our attention their paper, 'Estimation of optimum tradeoff parameters using the extended information criterion (EIC): an application to deconvolution', published in the Journal of Seismic Exploration (Sacchi & Ulrych 1994; hereafter referred to as SU94). We were not aware of their work before writing our own paper (Gurrola, Baker & Minster 1995; hereafter referred to as G. et al.) because ours was submitted to Geophysical Journal International in March 1993.

We are aware that our treatment is akin to the Wiener filter approach to time-domain deconvolution. We do not claim to have originated the application of Backus-Gilbert inversion to this problem. We reference Sipkin & Lerner-Lam (1992) and Oldenburg (1981) because they address problems very similar to our own.

We do apologize for the imprecision in our claim that frequency-domain deconvolution using the water-level method is subjective and time-consuming. In G. et al., we were comparing the simultaneous time-domain deconvolution with the most common method used in receiver function studies—hand selection of the 'water level' on a case-by-case basis. It is absolutely true that the FFT computations required for frequency-domain deconvolution are faster than the matrix inversion required for a time-domain deconvolution. Our characterization of the former as 'time-consuming' referred to the standard hand picking of water levels—not to CPU time. The main point of G. et al. was, however, that simultaneous deconvolution improves the signal-to-noise ratio within the deconvolution and reduces the amount of pre-whitening necessary in either domain. In G. et al., we decided to concentrate on the time domain because it is more easily adaptable to the specific problems that we addressed. We appreciate SU96's recognition of this fact in their concluding remarks.

REFERENCES


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