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Bogdan G. Nita* (nitab@mail.montclair.edu), Department of Mathematical Sciences,
Montclair State University, 1 Normal Avenue, Montclair, NJ 07043. *Inverse scattering algorithms
for attenuating artifacts produced by internal multiple reflections (reverberations).*

Inverse scattering series provides a setting for performing full multi-dimensional inversion with the purpose of determining the structure and the properties of an unknown medium without providing adequate a priori information about that medium. The only information needed is the data recorded outside of the medium and complete knowledge of a medium of choice, the reference medium; the only requirement is the convergence of the series in the presence of this information. Certain useful independent tasks can be identified as sub-series in the inverse scattering series with better convergence properties than the full series. An example of such of sub-series/sub-task is the one for eliminating the artifacts produced by internal multiple reflections or reverberations.

In this talk we will discuss and compare two algorithms for attenuating internal multiple reflections based on the inverse scattering series. The algorithms, although similar in concept, are written in different domains which lead to significant differences in their capability. We will present the mathematical concepts behind the theory and analytic examples to emphasize the differences and similarities between them and to support these concepts. (Received September 23, 2005)