Raypath interferometry for dummies

David C. Henley

ABSTRACT

We illustrate here the key processing steps used to apply raypath interferometry to the source or receiver gathers of a 2D seismic line in order to remove the time/phase disturbances due to the near-surface of the earth. While we don’t show all the processing steps, we show the important ones. We illustrate the processing flows with examples from two different sets of field data.

RAYPATH INTERFEROMETRY BY THE NUMBERS

We show 7 basic steps in the application of raypath interferometry:

1. Transform input gathers to the radial trace (R-T) domain—(Figures 1 and 2)

2. Sort R-T traces to common-angle gathers—(Figures 3 and 4)

3. Create pilot trace gathers using horizon picks—(Figures 5, 6, 7, and 8)

4. Correlate pilot trace and raw trace common-angle gathers—(Figures 9 and 10)

5. Apply inverse filters to raw common-angle gathers—(Figures 11 and 12)

6. Re-sort corrected common-angle gathers to R-T transforms—(not illustrated)

7. Inverse transform R-T gathers to X-T domain—(not illustrated)

Before and After

Figures 13 and 14 show the improvement sometimes possible with raypath interferometry, as the seismic image is improved throughout.

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