IMPROVING THE ESTIMATION OF THE COMMON-REFLECTION-SURFACE (CRS) PARAMETERS USING LOCAL SLOPES

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Present-day techniques to estimate the traveltime parameters of the common-reflection-surface (CRS) stack rely on local coherence analyses that are tedious and time-consuming processes. However, the extraction of traveltime attributes, particularly local slopes, has received strong attention in the recent past, because local slopes directly extracted from prestack data are useful in a variety of seismic imaging processes. In a previous work we have shown how the CRS parameters relate to local slopes in order to speed up their extraction. Of course, this relationship is most straightforward for the emergence angle of the normal ray. We demonstrated how the complete set of CRS parameters can be estimated by the application of modern, more advanced local-slope-extraction techniques, that are several orders of magnitude faster than conventional local coherence analysis. However, that approach relied on the derivatives of the extracted local slopes. Such derivatives can be unstable, leading to errors in the extracted parameter values. In this work, we reformulate such technique and show that the use of slope derivatives can be avoided. Our numerical examples demonstrate that this new procedure improves the values of the extracted parameters.