Prestack Migration Footprint

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Summary

The purpose of this paper is to explain in as basic a manner as possible how prestack migration footprint originates, how it relates to acquisition geometry, and how it relates to interpolation methods that aim to reduce the effect of footprint.

It is sometimes believed that it is only 3D data that suffers from prestack migration footprint, such as shown on a 3-D timeslice in Fig. 1, but this is not the case. Cary (2007) showed with a synthetic example that 2-D migration is capable of generating footprint as well. The origin of footprint in 2-D data is due to the pattern of edges of migrated shot gathers that survive the migration process. In this presentation, it will be shown that the origin of footprint in 3-D data is from the pattern of migrated cross-spreads that survive the migration process. This statement is not obviously true, so much of the presentation will be concerned with coming to an understanding of the basic elements of migration so that this statement will make sense. Although this presentation is meant to be tutorial in fashion, experts will hopefully also find it illuminating.
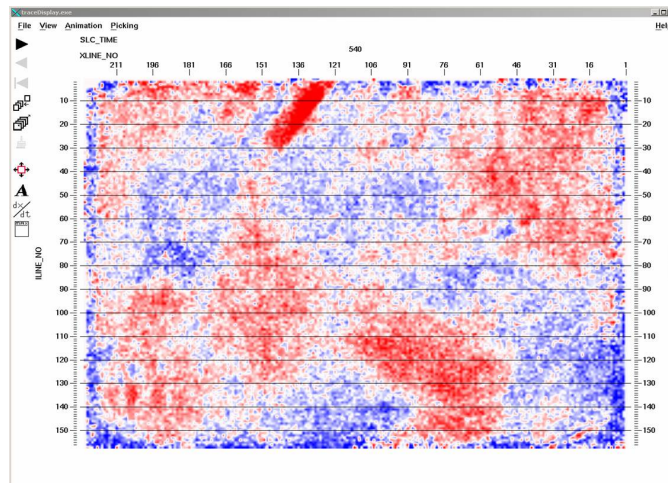
Figure1: An example of footprint in the form of a cross-hatched interference pattern on a 3-D timeslice.

References

Cary, P. W., 2007, 2-D migration footprint: The CSEG Recorder, **June**, 22-24.