@ High Resolution Image Stacking in Geophysical Seismic Data Processing

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Near surface velocity and layer thickness variation cause time anomalies or noise in geophysical seismic data processing that can be approximated as surface-consistent static time shifts. The conventional methods for residual static estimation and removing noise are based on Normal Move-Out corrected data. However, pre-stack Kirchhoff time or depth imaging time shifts all input traces within the migration aperture for aligning their reflection events horizontally. This method requires a good velocity model without structure assumptions before stacking for generating Common Imaging Gather (CIG). These time-shifting traces provide a powerful dataset to estimate the noise level and maximize the stack power of a CIG stack by using the correlation approach. Also, imaging sections by applying the residual error corrections at CIG can provide us with high solution imaging compared to the conventional methods. Using this approach in our models as well as in actual data improves the reflection event continuities and imaging resolution of the pre-stack Kirchhoff migrations.