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Velocity-less migration using horizontal slownesses

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We use the traveltime and its derivatives with respect to the source and receiver locations to find the reflector position and velocity for nonplanar reflectors. The obtained reflection location and velocity are attributes of each trace, and hence allow for lateral heterogeneity. For one layer case, the velocity is the interval velocity. For multiple layers, the velocity is nontrivially related to the interval velocities. We use the obtained velocities not only for imaging, but also for multiples suppression. We demonstrate the method on synthetic data.