

## VERIFICATION OF MACRO-SUBSURFACE MODELS USING A SHOT RECORD APPROACH (2-20)

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It is nowadays well known that a so-called macro-subsurface velocity model is needed to perform an accurate depth migration. The macro-subsurface model contains all the trend information, i.e. it describes the propagation effects of the subsurface. A new method is presented to update and verify the macro-subsurface model. The method uses intermediate results from a shot record migration scheme. Depth migration can be subdivided into two main steps. The first step is the extrapolation of the data recorded at the surface. The extrapolation operators are derived from the macro-subsurface model and the wave equation. The second step in migration is the imaging step. After imaging, which is generally taking the zero-time components from the extrapolated data, a migrated depth section will be the result. It is shown that with prestack migration techniques it is possible to construct true zero-offset traces at any depth point in the subsurface before imaging. This property is used to construct VSP-like sections of true zero-offset data. From such (z,t)-panels a depth focusing analysis can tell whether the macro-model was correct and, if not, how the parameters in the model have to be updated. The reason that shot record migration is preferred over a full prestack depth migration scheme (such as S-G migration) is twofold. First, with the shot record approach the zero-offset data can be studied before and after common depth point stacking has been applied (CDP-analysis and depth focusing analysis respectively). Second, the shot record oriented technique is still feasible in 3D because of the easier data handling. The method is illustrated by applying it to synthetic acoustic and elastic data as well as to watertank measurements and real data. 3D extensions are also discussed.

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