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AREA OF EXPERTISE:	Geophysics
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DISSERTATION TITLE: *On the use of super-resolution algorithms in seismics: applications within diffraction separation and imaging*

During the recent years the use of seismic diffracted waves to obtain high-resolution images of the subsurface has been a popular area of research. Such diffractions carry information about geological features like fractures, faults, pinch-outs, rough edges of salt bodies and other small-scale heterogeneities. These geological structures are often connected with potential hydrocarbon reservoirs and thus of vital importance to map. However, to extract the information content of these diffractions is not a trivial task. The reason is that the diffracted waves often are masked by the stronger reflections. The main objective of this thesis has therefore been to develop a technique to separate diffractions from reflections and further use them in high-resolution or super-resolution imaging of small-scale geological features. A separation technique based on kinematic differences between diffractions and reflections has been developed. In addition, a high-resolution imaging technique based on ideas from the Multiple Signal Classification (MUSIC) concept has also been constructed. The new approach to super-resolution processing of seismic data has been demonstrated with success using both synthetic and field data.