# ACOUSTICS2008/2285
# Comparative Study of Wideband Subspace Direction of Arrival (DOA) estimation methods

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Signal subspace Methods like ESPRIT, MUSIC and MATRIX PENCIL, provides high resolution Direction Of Arrival (DOA) estimation in comparison to traditional Delay and Sum and Capon methods, which are limited by sensor spacing. However underwater Acoustics signals are inherently wideband in nature and most of these Subspace methods works on narrowband signals. Currently modified version of these methods for wideband signals are emerging. These methods are broadly classified as Coherent and Incoherent methods depending upon how signals of different frequencies have been merged. Performances of these methods are evaluated using extensive Monte-Carlo simulations under various protocols by comparing there Mean Square Error in DOA estimation and by their respective resolution power. This comparison study is also complemented with real acoustic data from public domain.