

Gridless parameter extraction using atomic norm

Many problems in engineering deal with the retrieval of relevant information from a parametrical model. Sparse linear mixtures of complex sinusoids in a continuously indexed dictionary is a problem that arises in radar, sonar, radio astronomy, seismology, etc. with the indexing characterizing an object/physical event's relevant parameters such as 3D positioning, velocity and/or acceleration. Typical approaches for extracting this information relies on a discretization of the intrinsically continuous dictionary whose clear drawback is the potential mismatch between the physical parameters and the grid. Atomic norm-based optimization does not rely on a discretization of the dictionary and make use of a multidimensional Vandermonde decomposition to solve continuously for the parameter dictionary.