

# Sparse Phase Retrieval: Overview and Extensions

Irena Bojarovska  
bojarovska@math.tu-berlin.de

AFG Oberseminar  
November 27, 2014

## Abstract

Compressed sensing investigates the recovery of sparse signals from linear measurements. But often, in applications like X-Ray crystallography, optical imaging, and quantum mechanics, one is given only the absolute values (squared) of the linear measurements. Recovering of such signals (not necessarily sparse) is known as the phase retrieval problem.

Recently, there is a big interest in merging these two research areas together: investigate the phase retrieval problem for signals which are sparse. By sparse, usually it is meant that the vector has a small number of nonzero coefficients.

One extension is then if the signal has only some sparse representation in a frame (dictionary), i.e. can be represented as a linear combination of a small number of atoms, or it is sparse in a fusion frame, i.e. lies in a union of a small number of subspaces, and so on. Another interesting extension is if the signal is sparse in the classical sense, but the measurements are given in the form of norms of projections of the signal onto subspaces.

We will give an overview of the current achievements in this field, and look into more details of the mentioned generalizations of the sparse phase retrieval problem.