

# Vector Recovery: Saturation Recovery and Phase Retrieval

Frames for a Hilbert space allow for a linear and stable reconstruction of a vector from linear measurements. In many real-world applications, sensors are set up such that any measurement above and below a certain threshold would be clipped as the signal gets saturated. We study the recovery of a vector from such measurements which is called declipping or saturation recovery. Phase retrieval is a similar problem where the goal is to recover a vector where only the intensity of each linear measurement of a signal is available and the phase information is lost. Using a frame theoretic approach to saturation recovery, we characterize when saturation recovery of all vectors in the unit ball is possible and then compare some of the known results in phase retrieval with saturation recovery.

This is joint work with Wedad Alharbi, Daniel Freeman, Brody Johnson, and Nirina Randrianarivony.