



# Basis Alteration for a Less Sparse Representation for Reduced Dynamic Range Requirement

BYU #2018-41

## DESCRIPTION

Researchers at BYU developed a technique that allows for a variety of measurements to be faster and more precise. The invention applies to the procedure of making measurements in a basis in which the thing being measured has a sparse representation. The technique is to modify the basis functions to make the information in the measurement be spread more uniformly over the measurement space.

## PROBLEM SOLVED

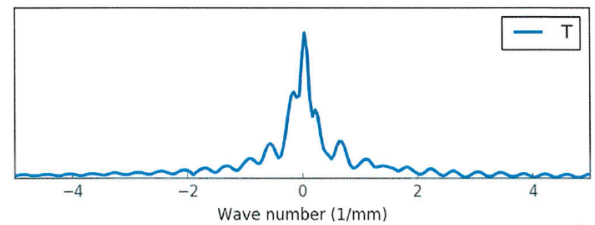
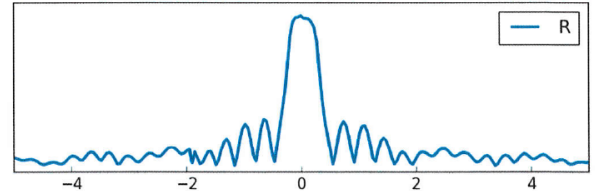
This method better spreads information over the different measurements in the measurement space, reducing the required dynamic range and signal to noise ratio in the measurements. By changing to a basis in which the data is "smoother", it can make it possible to better infer missing information from an incomplete sampling of measurement space.

## KEY ADVANTAGES

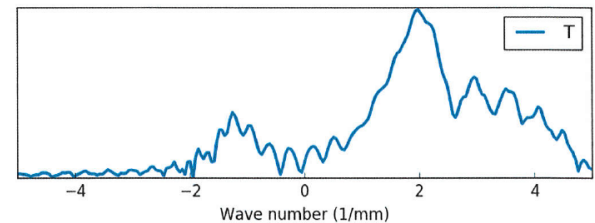
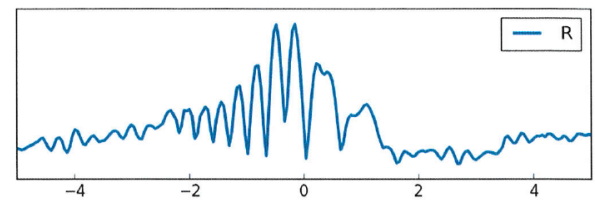
- » *Faster and more precise measurements*
- » *Less expensive detectors may be used*

## APPLICATIONS

The invention would most likely be used in MRI Imaging and could be of interest to any company that develops or sells magnetic imaging devices.

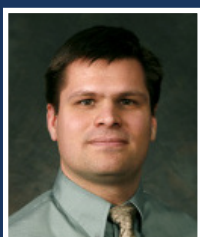


The measurements made in the Fourier basis without distorting (first set of images) and then distorting the wavefront (second set of images) for both the light reflected by (R) and transmitted around (T) the object.



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Patent Pending



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