

Mathematics Department Graduate Seminar February 20, 2007

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Title: Discrete Fourier Transforms

Abstract: The Discrete Fourier Transform (DFT) of a function $f(x)$ sampled at N equally spaced points consists of a set of N coefficients given by the equation:

$$F_k = \frac{1}{N} \sum_{n=-\frac{N}{2}+1}^{\frac{N}{2}} f_n e^{-i2\pi k / N}$$

The DFT has numerous applications, to include data analysis, approximate solutions for boundary value problems, and digital filtering. It is also closely related to the continuous Fourier Transform and Fourier Series. In this talk I will discuss the background and derivation of the DFT, and provide some examples and applications.