Fast Fourier Transform

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Abstract

Using the method of Fast Fourier Transform (FFT), we numerically calculate the power spectrum, the derivative of a function, and Poisson's equation. The spacing of the grid is uniform for $x = [0, L]$ and/or $y = [0, L]$ for N intervals. We observe how the power spectrum behaves under various L and N values. By fixing $L = 16$ and varying N, we observe the exponential accuracy of using the FFT to numerically differentiate a function. Finally, the FFT solves for the potential and electric field for the circular and exponential charge distributions.