THESIS PROPOSAL

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1. Introduction

1.1. **Fourier Continuation.** Fourier Continuation (FC) is an approximation method used to extend the computational abilities of a Fourier Series to non-periodic functions.

1.2. **Past Work.**

2. Current Work

2.1. **Application to the Heat Equation.**

2.2. **Green's Functions.**

2.3. **Results.**

3. Future Work

3.1. **Computational Work.** We are going to use this to put as a time step of the heat equation and solve that PDE. Our goal is to show that we have a stable approximation that can be used.

3.2. **Analytical Work.** The result that yields the same Fourier coefficients for any given Gram polynomial independent of choice of α is unexpected. Our goal is to develop an analytic proof that justifies this result in general.