

Abstract Submitted  
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**Electrocardiogram analysis through time discrete Fourier transform**<sup>1</sup> CAMERON LANCASTER, GUOPING ZHANG, Department of Physics, Indiana State University — The motivation for this research is to find an alternative method to diagnose heart conditions. This can be accomplished by analyzing wave patterns in EKG data, and using the Fourier Transform to compare steady wave patterns against fibrillating wave patterns. The two main contributors are the following: heart electricity and Fourier Transform. Also, it is recognized that ion movement has potential to change the frequency in any heart beat signal. This effect is caused due to a strong electrostatic attraction that causes the membrane capacitance to build charge. For a single ion focus, the Nernst Potential influences the equilibrium potential for the membrane of an ion. If two or more ions are contributing to an electric field charge, the Goldman-Hodgkin-Katz will find the membrane equilibrium potential. If a membrane has an efflux, or influx, of ions, then it is possible to get the passive flow of the electric current to zero. In continued research, we will gain knowledge of solving equations; such as ionic flux, quantitative diffusion, electric current density, and more. The finishing portion of this research will be to compare the Fourier Transformed wave graphs to determine heart conditions.

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