Development of optical models for non-invasive glucose testing
Jeffrey Spencer & Gregory Triplett

Current blood glucose measurement techniques are invasive and uncomfortable. Developing a non-invasive technique will not only alleviate part of the pain involved with current techniques but also cost less, greatly benefiting over 16 million diabetics in America. The technical road block impeding current progress is the development of a technique to obtain the current glucose levels through the skin. This is extremely complex due to the inhomogeneous nature of skin and various elements that absorb large spectrums that overlap with the absorption spectrum of glucose. A model accounting for the inhomogeneous nature and absorption spectrum within the skin could help to determine the ideal characteristics of low energy radiation that penetrate the skin and obtain valuable information beneath the dermis layer. In this work, we begin the development of optical models for investigating the feasibility of this non-invasive approach.