1 Introduction

Development in methods for solving integrals have long been important in order to solve problems with an increasing degree of complexity. Gaussian quadrature is an elegant method, that drastically increases the accuracy of numerical integration, compared to other methods like trapizoidal integration. Gauss-Legendre and Gauss-Laguerre are two types of Gaussian quadrature which in this report will be compared in accuracy and speed for a multidimensional integral describing the energy of electrons in a Helium atom. In addition, two approaches to the Monte Carlo method of integration are implemented and compared as well. Parallelization will also be done to the program running the Monte Carlo integration.

First the theory of the different methods is presented, followed by our results and finally a discussion.