FYS3150-Project 2

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Abstract

1 Introduction

2 Method

We find the analytical eigenvalues by using armadillos functions for diagonalizing a matrix. These values are to be compared with values found using the Jacobi method.

The general expression for the new matrix elements are:

$$b_{ii} = a_{ii}, i \neq k, i \neq l$$

$$\begin{aligned} b_{ik} &= a_{ik}\cos\theta - a_{il}\sin\theta, i \neq k, i \neq l \\ b_{il} &= a_{il}\cos\theta + a_{ik}\sin\theta, i \neq k, i \neq l \\ b_{kk} &= a_{kk}\cos^2\theta - 2a_{kl}\cos\theta\sin\theta + a_{ll}\sin^2\theta \\ b_{ll} &= a_{ll}\cos^2\theta + 2a_{kl}\cos\theta\sin\theta + a_{kk}\sin^2\theta \\ b_{kl} &= (a_{kk} - a_{ll})\cos\theta\sin\theta + a_{kl}(\cos^2\theta - \sin^2\theta) \end{aligned} \tag{1}$$