TMA4280 - Exercise 6

Rolf H. Myhre and Eirik Hjertenæs

04.04.14

Summary

In this report, a parallell implementation of a Discrete Sine Transform solver of the two-dimensional Poisson problem is presented. The implementation is a hybrid between MPI and OpenMP suited for a distributed memory system with multi-threading per MPI-process. The developed code is evaluated with respect to accuracy and efficiency. The hybrid version of the program is also compared to a purely MPI code.

1 Introduction

In this exercise we have studied the two dimensional Poisson problem on a unit square. The problem can be formulated as follows:

$$-\nabla^2 u = f \quad \text{in} \quad \Omega = (0,1) \times (0,1) \tag{1}$$

$$u = 0 \quad \text{on} \quad \partial\Omega \tag{2}$$

2 Results

3 Discussion and Conclusions