
SF2520 - Laboratory 5

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Introduction

In this report we present the results of Lab 5. We had to solve an elliptic problem using first Matlab and then Comsol Multiphysics.

1 Matlab finite difference solution

bla

2 Comsol Multiphysics solution

blo

3 More Comsol

blu

Codes

```
h = 0.2;
N = 19; M = 11;% N is x-direction. M is y-direction
n = N*(M+2);% size of system
e = ones(n,1);
A = spdiags([-e -e 4*e -e -e],[-N -1 0 1 N],n,n);
%1) add known values on sides in term b
b = zeros(n,1);
b(1:N:end) = 300;
b(N:N:end) = 600;
for i = 1:M-1
    A(2+i*N, 2+i*N-1) = 0;
    A(N+(i-1)*N, N+(i-1)*N +1) = 0;
end

%2) correct lower and upper equations with ghost points etc
for i = 1:N
    A(i,i+N) = -2;
    A(end-i+1, end-i+1-N) = -2;
end

U = A\b;
U = reshape(U,N,M+2)';
U = [300*ones(M+2,1) U 600*ones(M+2,1)];
imagesc(U)
```