This script is a basic example on the usage of "adaptation masks"

Contents

Initialization

```
clear all; close all;
run('../../SOURCES_MATLAB/SF_Start.m');ffdatadir = './';verbosity=0;
mkdir('FIGURES');
```

```
Warning: Directory already exists.
```

Generation of the mesh

```
Ndensity =100;
ffmesh=SF_Mesh('Lshape_Mesh.edp','Params',Ndensity)
```

```
ffmesh =

        DataDescription: '(Auxiliary file with information on initial mesh)'
               datatype: 'Mesh'
               meshtype: '2D'
                     np: 8726
                     nt: 17050
               deltamin: 0.0076
               deltamax: 0.0178
                 deltaA: 0.0131
            problemtype: 'EXAMPLE'
                      R: 1
      InitialMeshDensity: 100
                 points: [3x8726 double]
                 bounds: [3x400 double]
                    tri: [4x17050 double]
                    nbe: 400
                 labels: 1
               filename: './/mesh.msh'
                    seg: []
          meshgeneration: 0
```

Compute and plot the "Mask" function

```
Mask = SF_Launch('AdaptationMask.edp','Type','rectangle','Params',[.1 .4 .1 .4 .01],'Mesh',
ffmesh,'DataFile','Mask.ff2m')
subplot(2,2,1);
```

```
SF_Plot(Mask,'Maskx.re');
subplot(2,2,2);
SF_Plot(Mask,'Maskx.im');
subplot(2,2,3);
SF_Plot(Mask,'Masky.re');
subplot(2,2,4);
SF_Plot(Mask,'Masky.im');
suptitle('Adaptation mask functions')

pause(1);
```

```
cp: mesh.msh and ././mesh.msh are identical (not copied).

Mask =

              mesh: [1x1 struct]
          filename: './Mask.txt'
   DataDescription: 'Adaptation Mask'
          datatype: 'MASK'
   datastoragemode: 'CxP2P2'
             Maskx: [8726x1 double]
             Masky: [8726x1 double]
```
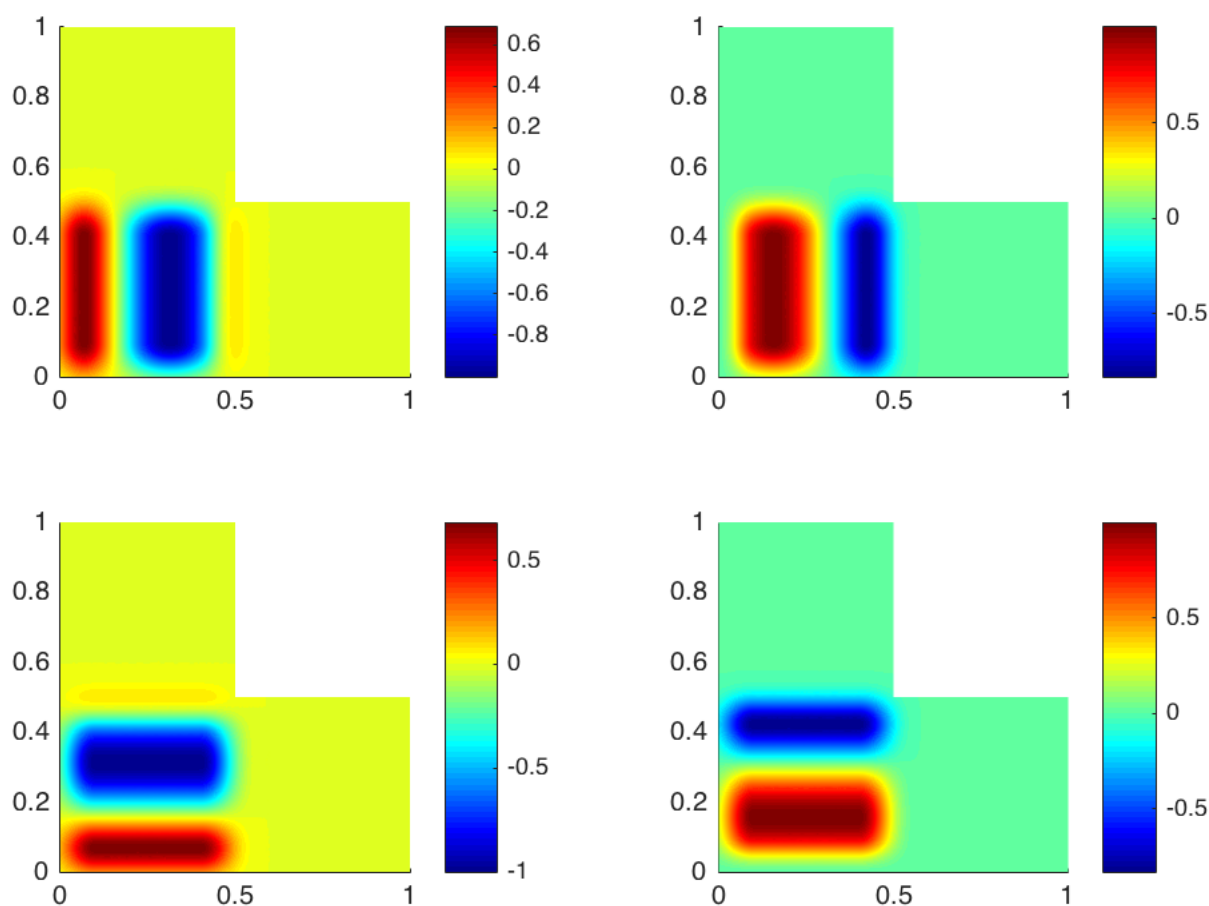

Adaptation mask functions

## Compute and plot the solution of a thermal problem

```
heatU=SF_Launch('Lshape_Unsteady.edp','Params',1000,'Mesh',ffmesh,'DataFile','Heat_unsteady
.ff2m')
figure();SF_Plot(heatU,'Tc.re','colormap','redblue','title','solution of thermal boundary-l
ayer problem');
```

```
cp: mesh.msh and ././mesh.msh are identical (not copied).

heatU =

              mesh: [1x1 struct]
          filename: './Heat_unsteady.txt'
   DataDescription: 'Temperature field in a L-shaped region ; Unsteady co...'
          datatype: 'EXAMPLE'
   datastoragemode: 'CxP1'
             omega: 1000
                Tc: [8726x1 double]
            normTc: [8726x1 double]
```


solution of thermal boundary-layer problem
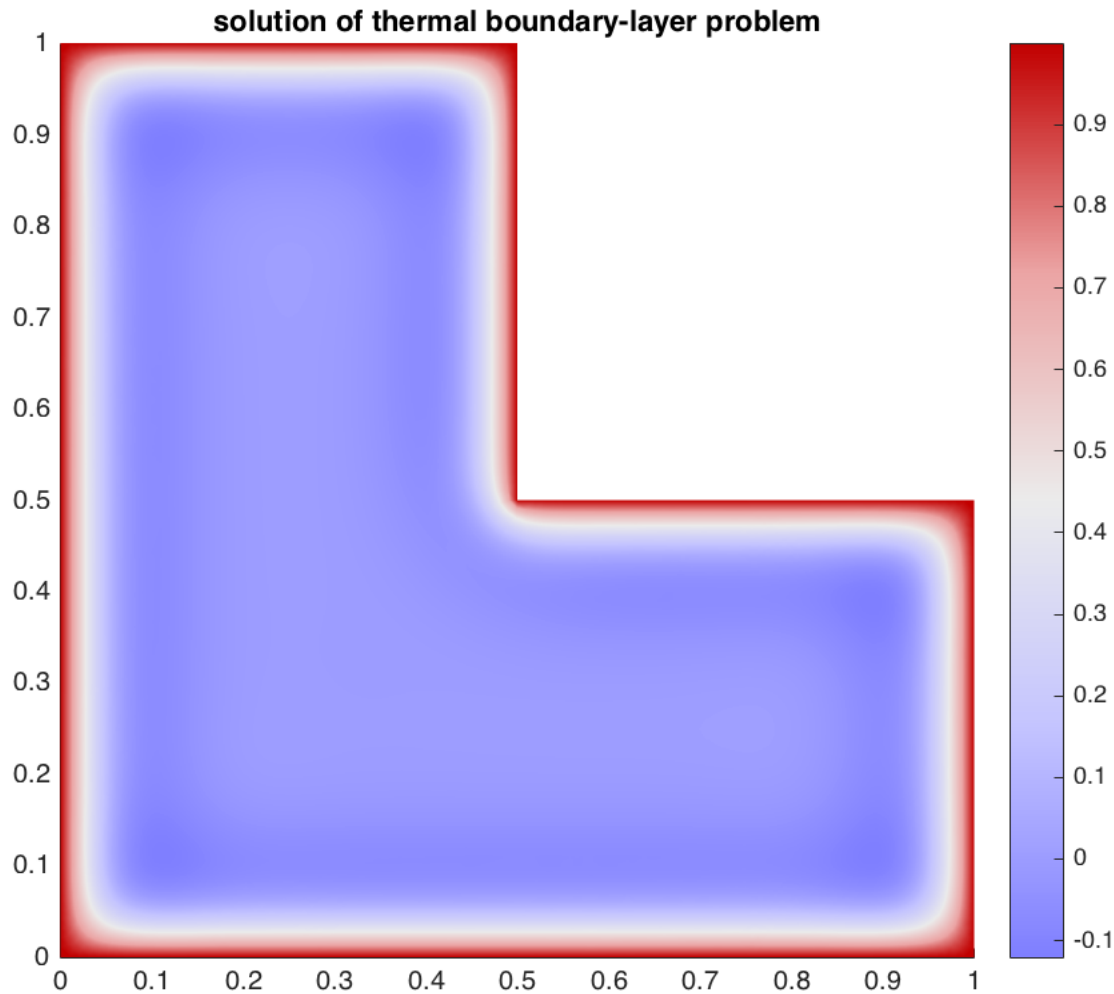
Performs mash adaptation accroding to this mask and the solution to the model problem

```
ffmesh2 = SF_Adapt(ffmesh,heatU,'Hmax',.1,'Hmin',1e-6)
ffmesh3 = SF_Adapt(ffmesh,Mask,'Hmax',.1,'Hmin',1e-6);
ffmesh4 = SF_Adapt(ffmesh,Mask,heatU,'Hmax',.1,'Hmin',1e-6);


figure;
subplot(2,2,1); SF_Plot(ffmesh,'title','initial mesh');
subplot(2,2,2); SF_Plot(ffmesh2,'title','adapted to Field');
subplot(2,2,3); SF_Plot(ffmesh3,'title','adapted to Mask');
subplot(2,2,4); SF_Plot(ffmesh4,'title','adapted to Field+Mask');
```

```
cp: ./mesh.msh and ././mesh.msh are identical (not copied).
rm: ./Eigenmode*: No such file or directory
```

```
ffmesh2 =

          DataDescription: '(Auxiliary file with information on initial mesh)'
                 datatype: 'Mesh'
                 meshtype: '2D'
                       np: 7736
                       nt: 15083
                 deltamin: 0.0023
                 deltamax: 0.1128
                   deltaA: 0.0488
              problemtype: 'EXAMPLE'
                        R: 1
        InitialMeshDensity: 100
                   points: [3x7736 double]
                   bounds: [3x387 double]
                      tri: [4x15083 double]
                      nbe: 387
                   labels: 1
                 filename: './MESHES/mesh_adapt1.msh'
                      seg: []
            meshgeneration: 1

cp: ./mesh.msh and ././mesh.msh are identical (not copied).
rm: ./Eigenmode*: No such file or directory
cp: ./mesh.msh and ././mesh.msh are identical (not copied).
cp: ./mesh.msh and ././mesh.msh are identical (not copied).
rm: ./Eigenmode*: No such file or directory
```