

Ipython_freefem++_example

August 2, 2016

1 Installation

You must install [Inkscape](#) to enable the magic function to the convert eps file to displayed in Ipython Notebook.

Then loding the magics function

```
In [2]: %reload_ext freefem_magic
```

Now we run some simple example,

```
In [3]: %%freefem
        cout << "Hello FreeFem++\n" << endl;

-- FreeFem++ v 3.380001 (date Sat Feb 6 20:00:25 UTC 2016)
Load: lg_fem lg_mesh lg_mesh3 eigenvalue
sizestack + 1024 =1072 ( 48 )
```

Hello FreeFem++

```
times: compile 0.006737s, execution 0.001022s, mpirank:0
CodeAlloc : nb ptr 2479, size :335736 mpirank: 0
Ok: Normal End
```

```
In [4]: %%freefem --display Laplace.eps --write laplace.edp
        load "iovtk"
        mesh Th=square(40,40);
        fespace Vh(Th,P2);          // P1 FE space
        Vh uh,vh;                   // unkown and test function.
        func f=1;                   // right hand side function
        func g=0;                   // boundary condition function

        problem laplace(uh,vh,solver=GMRES,tgv=1e5) =                      // defin
            int2d(Th)( dx(uh)*dx(vh) + dy(uh)*dy(vh) ) // bilinear form
        - int2d(Th)( f*vh ) // linear form
        + on(1,2,3,4,uh=g) ; // boundary condition form
```

```

        laplace; // solve the problem plot(uh); // to see the result
        plot(uh,ps="Laplace.eps",value=true,fill=1);
        savevtk("Laplace.vtk", Th, uh,dataname="uh");

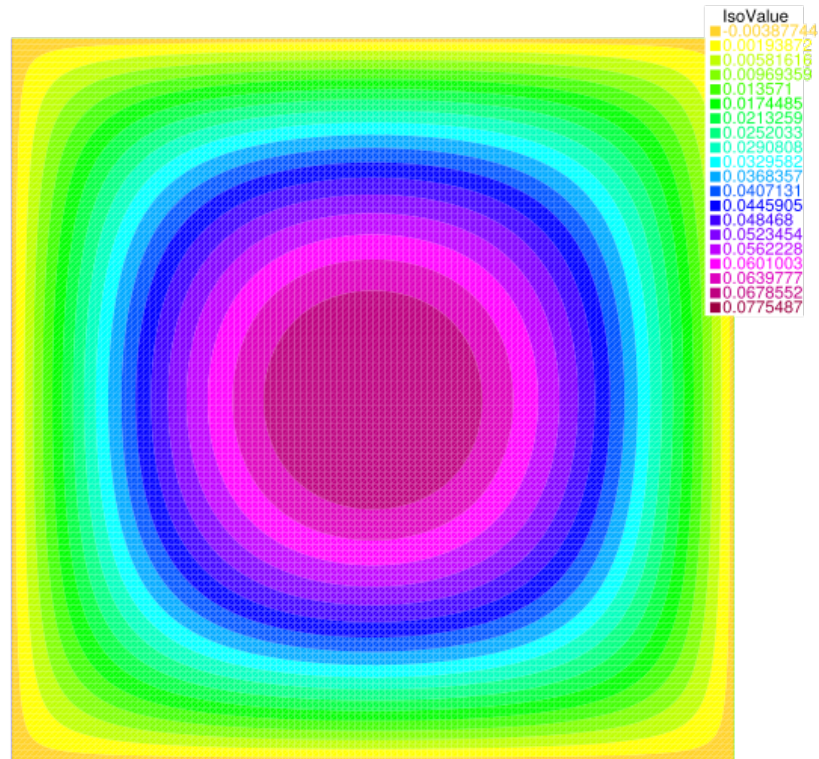
-- FreeFem++ v 3.380001 (date Sat Feb 6 20:00:25 UTC 2016)
  Load: lg_fem lg_mesh lg_mesh3 eigenvalue
  (load: dlopen /usr/lib/freefem++/iovtk.so 0x298c930) load: iovtk
Write Mesh and Solutions in VTK Formats
  sizestack + 1024 =1736 ( 712 )

  -- Square mesh : nb vertices =1681 , nb triangles = 3200 , nb boundary edges 1
GMRES converges: 616 2.65802e-09 0.00268368 9.90436e-07 < 1e-06
  -- Solve :
        min 5.49917e-14 max 0.0736713
  0x298da00 VTK_FILE 1
times: compile 0.092834s, execution 0.555838s, mpirank:0
  CodeAlloc : nb ptr 2564, size :341608 mpirank: 0
Ok: Normal End

Background RRGGBBAA: fffffff0
Area 0:0:745:526.25 exported to 745 x 526 pixels (90 dpi)
Bitmap saved as: Laplace.eps.png

```

Out[4]:



```
In [5]: %%freefem --displaysvg Laplace.eps --write laplace.edp
        load "iovtk"
        mesh Th=square(40,40);
        fespace Vh(Th,P2);      // P1 FE space
        Vh uh,vh;               // unknown and test function.
        func f=1;                // right hand side function
        func g=0;                // boundary condition function

        problem laplace(uh,vh,solver=GMRES,tgv=1e5) =                // defin
            int2d(Th) ( dx(uh)*dx(vh) + dy(uh)*dy(vh) ) // bilinear form
            - int2d(Th) ( f*vh ) // linear form
            + on(1,2,3,4,uh=g) ; // boundary condition form

        laplace; // solve the problem plot(uh); // to see the result
        plot(uh,ps="Laplace.eps",value=true,fill=1);
        savevtk("Laplace.vtk", Th, uh,dataname="uh");

-- FreeFem++ v 3.380001 (date Sat Feb 6 20:00:25 UTC 2016)
Load: lg_fem lg_mesh lg_mesh3 eigenvalue
(load: dlopen /usr/lib/freefem++/iovtk.so 0x267d930) load: iovtk
Write Mesh and Solutions in VTK Formats
sizestack + 1024 =1736 ( 712 )
```

```

-- Square mesh : nb vertices  =1681 ,  nb triangles = 3200 ,  nb boundary edges 1
GMRES converges: 616 2.65802e-09 0.00268368 9.90436e-07 < 1e-06
-- Solve :
      min 5.49917e-14  max 0.0736713
0x267ea00 VTK_FILE 1
times: compile 0.007858s, execution 0.631519s,  mpirank:0
CodeAlloc : nb ptr  2564,  size :341608 mpirank: 0
Ok: Normal End

```

Out [5]:

