Connected to Python 3.10.12

In [ ]:

```
# This has to be executed at every time we run the docker image (could be automatized ?)
# sudo apt-get update && sudo apt-get install xvfb && pip install --user xvfbwrapper pyvista plotly panel
# ./tools/load_xvfb.sh  for plotting in docker term


import sys
import feelpp
import feelpp.toolboxes.core as tb

from tools.solvers import Poisson

# mandatory things
sys.argv = ["feelpp_app"]
e = feelpp.Environment(sys.argv,
                       opts=tb.toolboxes_options("coefficient-form-pdes", "cfpdes"),
                       config=feelpp.localRepository('feelpp_cfpde'))

# ------------------------------------------------------------------------ #
# Poisson problem
# - div (diff * grad (u)) = f    in Omega
#                       u   = g    in Gamma_D
# Omega = domain, either cube or ball
# Approx = lagrange Pk of order order
# mesh of size h

# 2D with varying RHS
P = Poisson(dim = 2)
P(h=0.08,  rhs='-1.0-1*y*x+y*y', g='0', order=1, geofile='geo/disk.geo', plot='2d.png')
P(h=0.08,  rhs='-1.0-1*y*x+y*y', g='0', order=1, geofile='geo/disk.geo', solver='scimba')


P(h=0.1,  rhs='-1.0-2*y*x+y*y', g='0', order=1, plot='f2.png')
P(h=0.1,  rhs='-1.0-2*y*x+y*y', g='0', order=1, solver ='scimba')

P(h=0.1,  rhs='-1.0-3*y*x+y*y', g='y', order=1, plot='f3.png')
P(h=0.1,  rhs='-1.0-3*y*x+y*y', g='y', order=1, solver ='scimba')


P(h=0.1,  rhs='-1.0-4*y*x+y*y', g='x', order=1, plot='f4.png')
P(h=0.1,  rhs='-1.0-4*y*x+y*y', g='x', order=1, solver ='scimba')

P(h=0.05, rhs='1',              g='0', order=1, plot='f5.png')
P(h=0.05, rhs='1 + x-x',              g='0', order=1, solver ='scimba')

# # 2D with varying anisotropy
#P = Poisson(dim = 2)
P(h=0.1, diff='{1.0,0,0,x*y}', rhs='1', plot='d1.png')
P(h=0.1, diff='(1+x,0,0,1+y)', rhs='1+ x-x', solver='scimba')

P(h=0.1, diff='{x,y,-y,x+y}',  rhs='1', plot='d3.png')
P(h=0.1, diff='(x,y,-y,x+y)',  rhs='1+ x-x', solver='scimba')

# 3D with varying anisotropy and non-homogeneous Dirichlet BC
#P = Poisson(dim = 3)
#P(h=0.08, diff='{1,0,0,0,x+1,0,0,0,1+x*y}', g = 'x', rhs='x*y*z', geofile = 'geo/cube.geo', plot='3d.png') # a



# ce qu'on voudrait

# 1 pouvoir résoudre dans scimba juste en changeant le flag "solver"
#P(h=0.08, diff='{1,0,0,0,x+1,0,0,0,1+x*y}', g = 'x', rhs='x*y*z', geofile = 'geo/cube.geo', plot='3d.png', sol

# pouvoir rcupérer le mesh et les dofs en sortie de P(...)
#mean


"""
pour scimba
# eval('__') rhs = x1
f = eval(rhs)
rhs.replace('x','x1')

"""
#mesh, dofs = P(...)....
#utiliser diff sur scimba dx*()+dy(+dz) cas matrice cte
```

```
Using device: cpu
torch loaded; device is cpu
Solving the laplacian problem for hsize = 0.08...
```

```
[ Starting Feel++ ] application feelpp_app version 0.1 date 2024-May-18
 . feelpp_app files are stored in /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1
 .. logfiles :/workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/logs
[loadMesh] Loading mesh in format geo+msh: "/workspaces/2024-m1-scimba-feelpp/geo/disk.geo"
[loadMesh] Use default geo desc: /workspaces/2024-m1-scimba-feelpp/geo/disk.geo 0.08
+-------------------------------------------------------------------------------------------------------------------------------------
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| Toolbox::cfpdes-2d-p1 - Use Case Study
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| +-------------------------------------------------------------------------------------+
|
| | Environment                                                                         |
|
| +-------------------------------------------------------------------------------------+
|
| |  prefix              : cfpdes                                                       |
|
| |  keyword             : cfpdes-2d-p1                                                 |
|
| |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
|
| |  number of processus : 1                                                            |
|
| +-------------------------------------------------------------------------------------+
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| +--------------------------+
|
| | Materials Properties     |
|
| +--------------------------+
|
| |  number of materials : 1  |
|
| +--------------------------+
|
| +-----------------------------------------------+
|
| | Meshes                                        |
|
| +-----------------------------------------------+
|
| | +-------------------------------------------+ |
|
| | | Mesh : cfpdes-2d-p1                       | |
|
| | +-------------------------------------------+ |
|
| | |  Discretization : /Mesh/object-1          | |
|
| | | +---------------------------------------+ | |
|
| | | | Import configuration                  | | |
|
| | | +---------------------------------------+ | |
|
| | | |  geo-filename          :              | | |
|
| | | |  hsize                 : 1.000000e-01  | | |
|
| | | |  generate-partitioning : 0            | | |
|
| | | +---------------------------------------+ | |
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| | | +-------------------------------+         | |
|
| | | | Discretization                |         | |
|
| | | +-------------------------------+         | |
|
| | | |  dim         : 2              |         | |
|
| | | |  h_average   : 1.012276e-01   |         | |
|
| | | |  h_max       : 1.349240e-01   |         | |
|
| | | |  h_min       : 8.067356e-02   |         | |
|
| | | |  n_elements  : 757            |         | |
|
| | | |  n_faces     : 1167           |         | |
|
```

```
| | | |  n_partition : 1             |          | |
|
| | | |  n_points    : 411           |          | |
|
| | | |  order       : 1             |          | |
|
| | | |  real_dim    : 2             |          | |
|
| | | |  shape       : Simplex_2_1_2  |          | |
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| | Algebraic Solver                |
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|
| | | Backend          |            |
|
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|
| | |  prefix : cfpdes  |            |
|
| | |  type   : petsc   |            |
|
| | +------------------+            |
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|
| | | KSP                        |  |
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|
| | |  atol       : 1.000000e-50  |  |
|
| | |  dtol       : 1.000000e+05  |  |
|
| | |  maxit      : 1000          |  |
|
| | |  reuse-prec : 0             |  |
|
| | |  rtol       : 1.000000e-08  |  |
|
| | |  type       : gmres         |  |
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|
| | | SNES                      |   |
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| | +---------------------------+   |
|
| | |  atol      : 1.000000e-50  |   |
|
| | |  maxit     : 50            |   |
|
| | |  reuse-jac : 0             |   |
|
| | |  rtol      : 1.000000e-08  |   |
|
| | |  stol      : 1.000000e-08  |   |
|
| | +---------------------------+   |
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| | +----------------------------+  |
|
| | | KSP in SNES                |  |
|
| | +----------------------------+  |
|
| | |  maxit      : 1000          |  |
|
| | |  reuse-prec : 0             |  |
|
| | |  rtol       : 1.000000e-05  |  |
|
```

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|
| | | PC                         | |
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|
| | |  mat-solver-package : mumps  | |
|
| | |  type               : lu     | |
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| | Toolbox Coefficient Form PDE : poisson_eq
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| +-------------------------------------------------------------------------------------------------------------------------------
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| | +-------------------------------------------------------------------------------------+
| |
| | | Environment                                                                         |
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| | +-------------------------------------------------------------------------------------+
| |
| | |  prefix              : cfpdes.poisson_eq                                            |
| |
| | |  keyword             : poisson_eq                                                   |
| |
| | |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
| |
| | |  number of processus : 1                                                            |
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| | | Physics
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| | | | poisson_eq
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| | | | | poisson_eq
| | | | |
| | | | +-------------------------------------------------------------------------------------------------------------------------
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| | | | |  modeling : GenericPDE
| | | | |
| | | | |  type     : poisson_eq
| | | | |
| | | | |  name     : poisson_eq
| | | | |
| | | | +-------------------------------------------------------------------------------------------------------------------------
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| | | | | Parameters
| | | | |
| | | | +-------------------------------------------------------------------------------------------------------------------------
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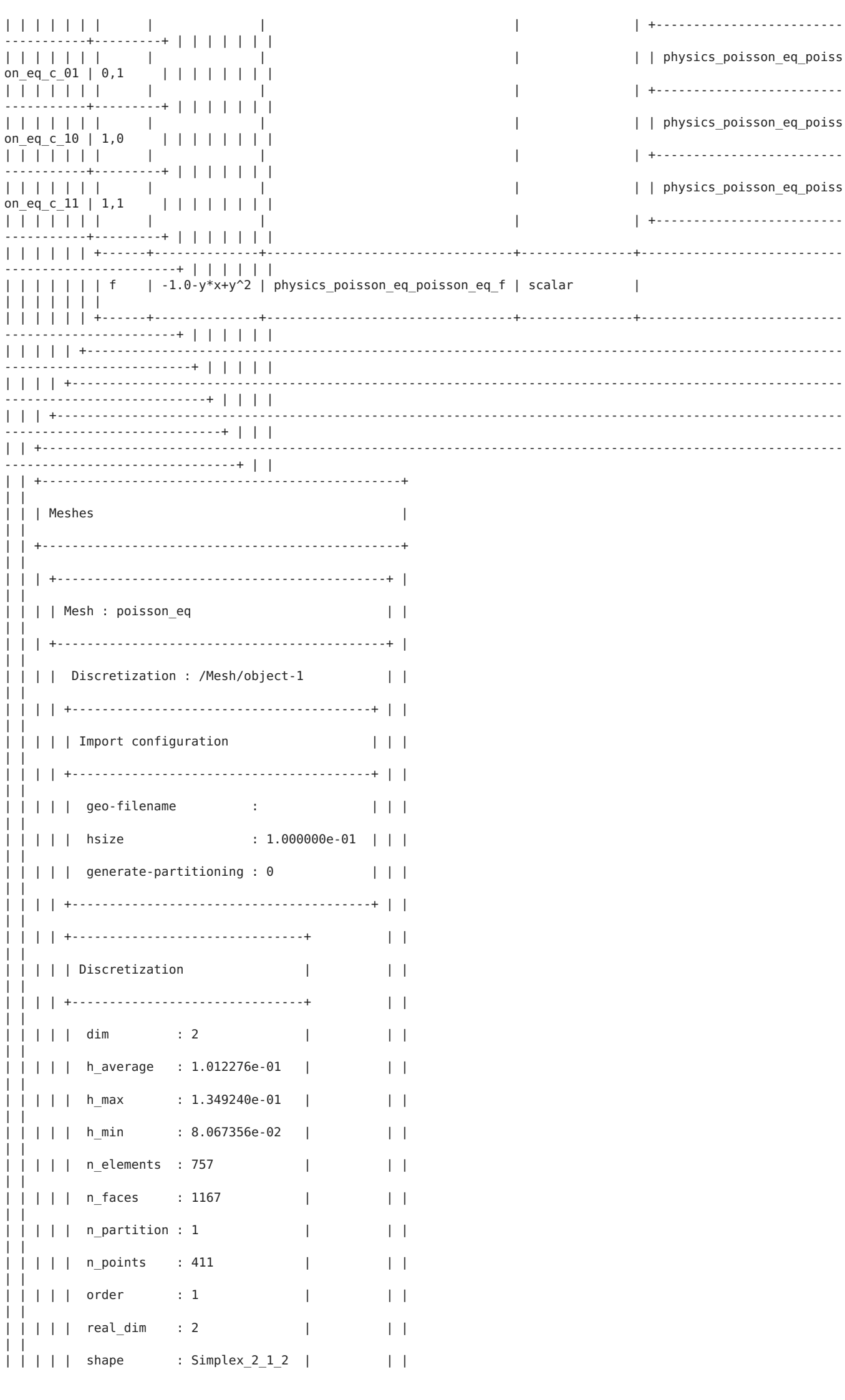
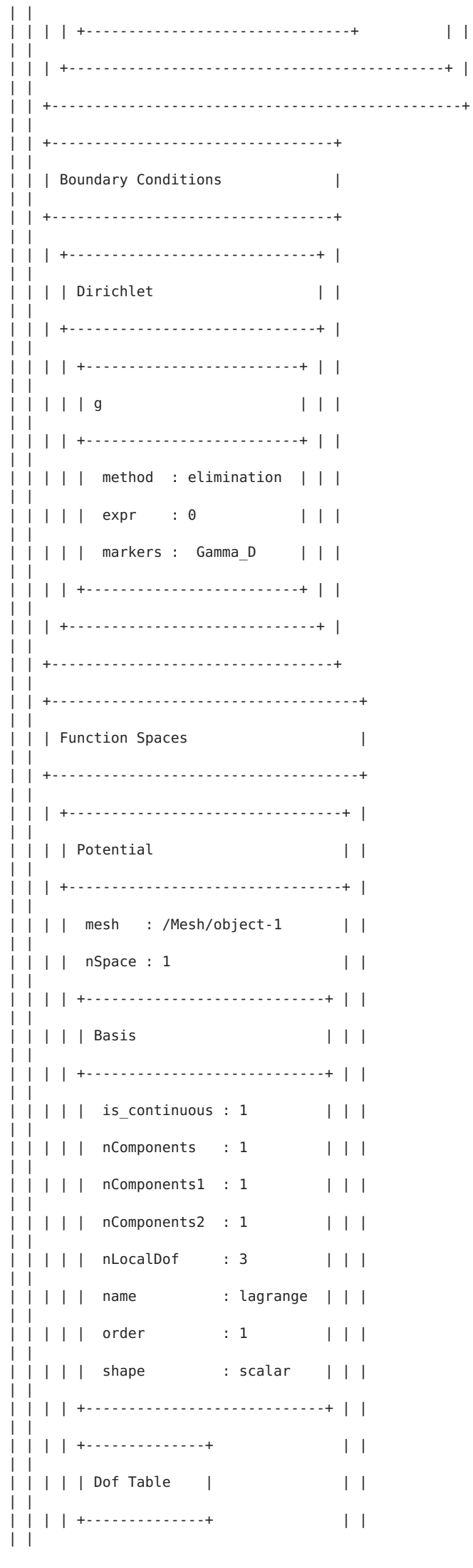
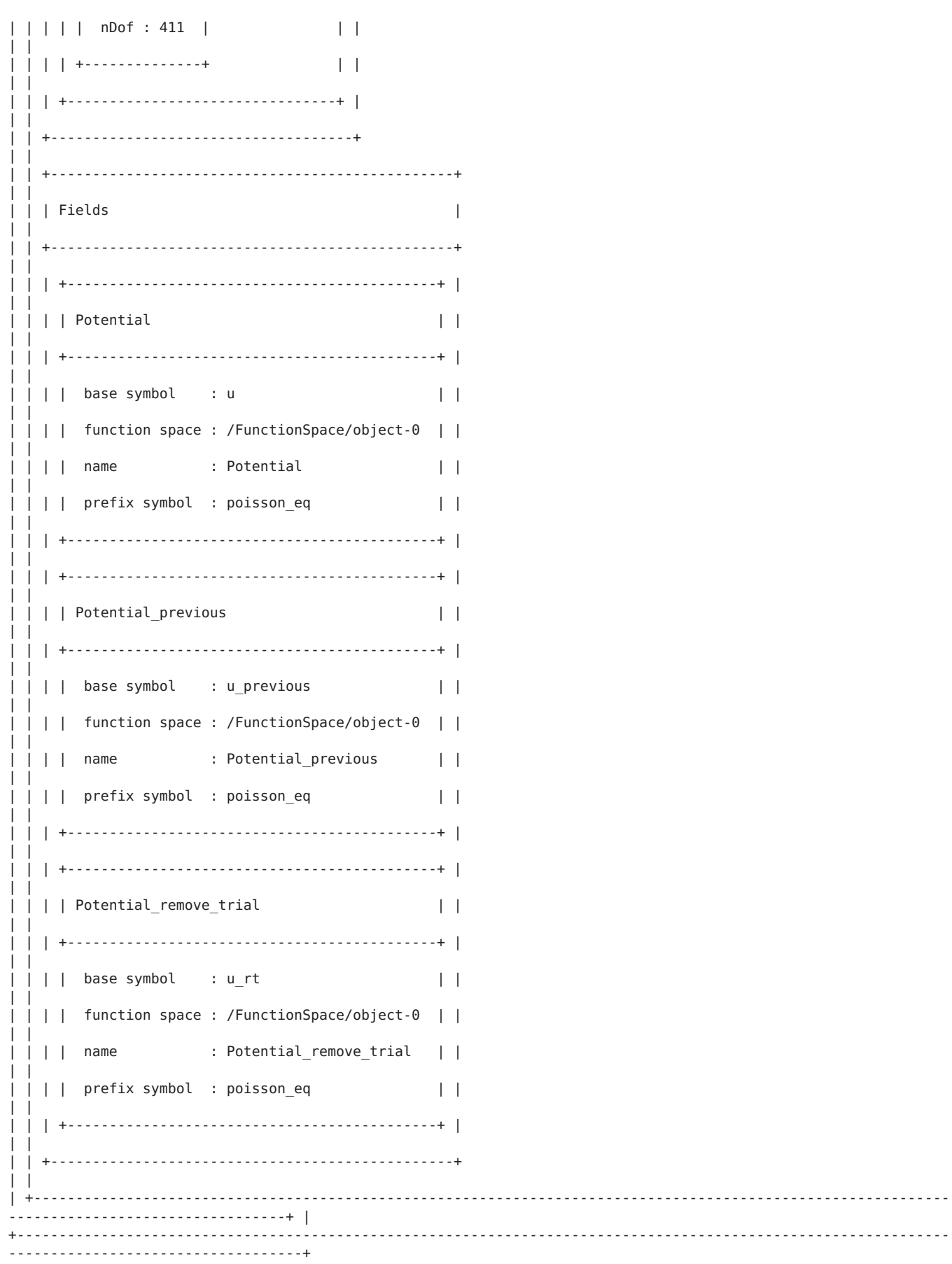
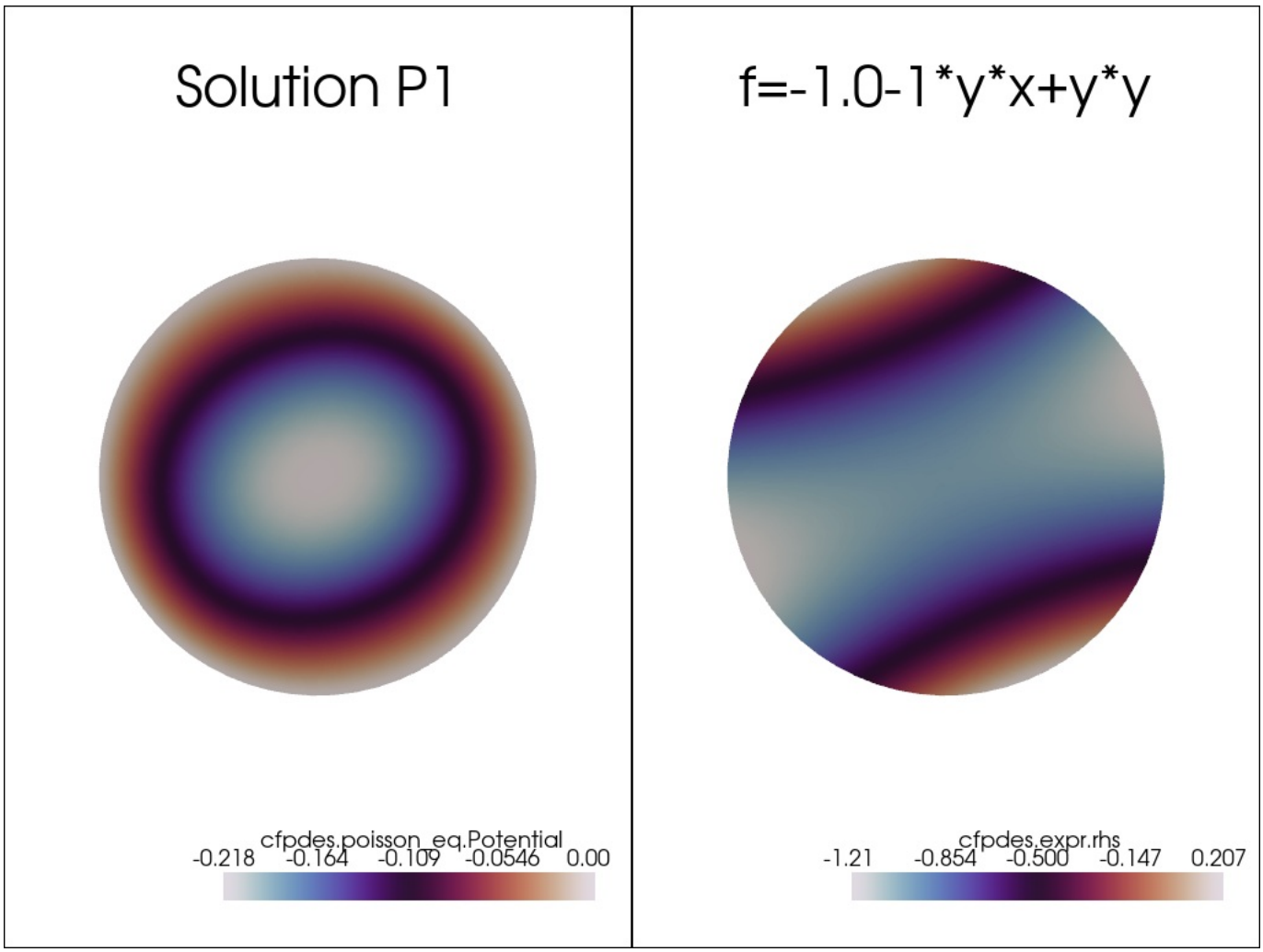
| | | | | +------+--------------+---------------------------------+---------------+-------------------------
----------------------+ | | | | | |
| | | | | | Name | Expression   | Symbol                          | Shape         | Components
| | | | | | |
| | | | | | +======+==============+=================================+===============+=========================
======================+ | | | | | |
| | | | | | c    | {1,0,0,1}    | physics_poisson_eq_poisson_eq_c | tensor2 [2x2] | +-----------------------
----------+---------+ | | | | | | |
| | | | | |      |              |                                 |               | | Symbol
| Indices | | | | | | |
| | | | | |      |              |                                 |               | +=======================
==========+=========+ | | | | | | |
| | | | | |      |              |                                 |               | | physics_poisson_eq_poiss
on_eq_c_00 | 0,0     | | | | | | | |
```

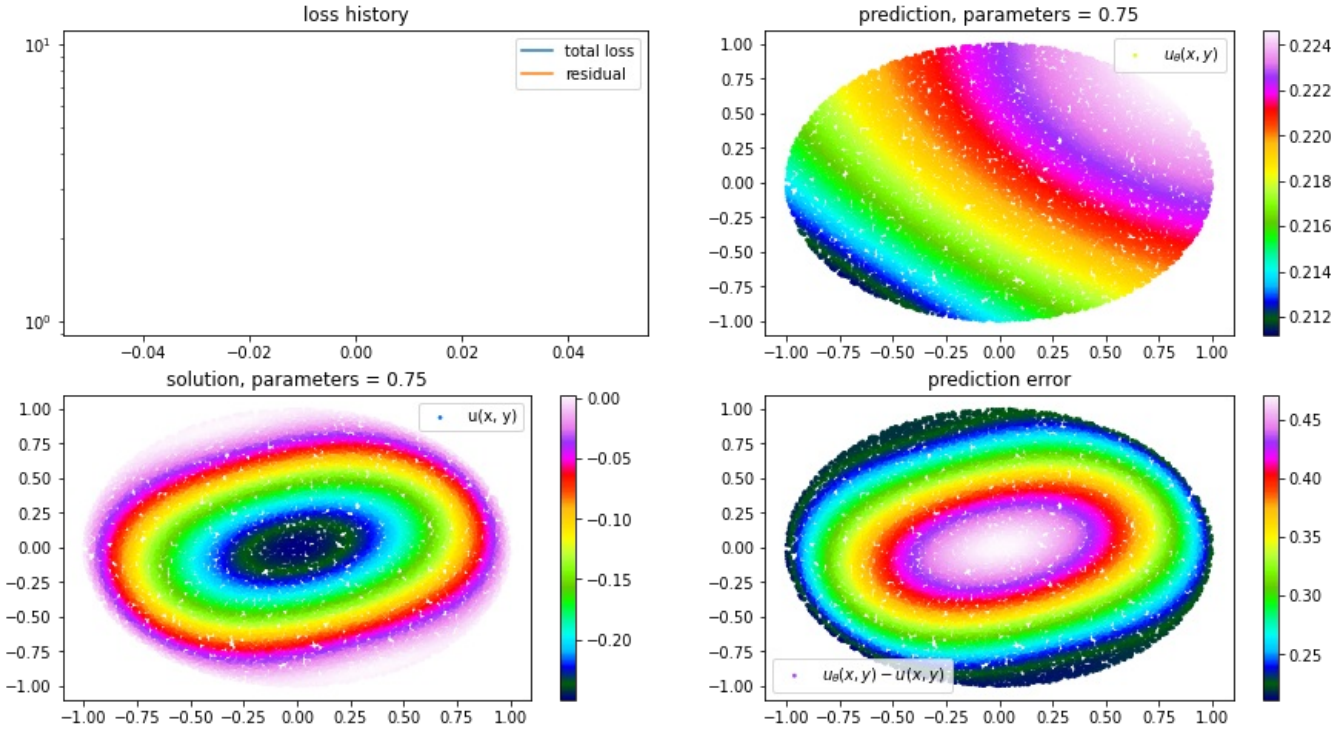

Meshes
Mesh : poisson_eq
Discretization : /Mesh/object-1
Import configuration
geo-filename :
hsize : 1.000000e-01
generate-partitioning : 0
Discretization
dim : 2
h_average : 1.012276e-01
h_max : 1.349240e-01
h_min : 8.067356e-02
n_elements : 757
n_faces : 1167
n_partition : 1
n_points : 411
order : 1
real_dim : 2
shape : Simplex_2_1_2
physics_poisson_eq_poisson_eq_c_01 | 0,1
physics_poisson_eq_poisson_eq_c_10 | 1,0
physics_poisson_eq_poisson_eq_c_11 | 1,1
f | -1.0-y*x+y^2 | physics_poisson_eq_poisson_eq_f | scalar


Boundary Conditions
Dirichlet
g
method : elimination
expr : 0
markers : Gamma_D
Function Spaces
Potential
mesh : /Mesh/object-1
nSpace : 1
Basis
is_continuous : 1
nComponents : 1
nComponents1 : 1
nComponents2 : 1
nLocalDof : 3
name : lagrange
order : 1
shape : scalar
Dof Table


nDof : 411
Fields
Potential
base symbol : u
function space : /FunctionSpace/object-0
name : Potential
prefix symbol : poisson_eq
Potential_previous
base symbol : u_previous
function space : /FunctionSpace/object-0
name : Potential_previous
prefix symbol : poisson_eq
Potential_remove_trial
base symbol : u_rt
function space : /FunctionSpace/object-0
name : Potential_remove_trial
prefix symbol : poisson_eq




```
Solving using Scimba
>> load network /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/networks/test.pth
network was not loaded from file: training needed
```




```
Solving the laplacian problem for hsize = 0.1...
[loadMesh] Loading mesh in format geo+msh: "/workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2
.geo"
[loadMesh] Use default geo desc: /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2.geo 0.1
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| Toolbox::cfpdes-2d-p1 - Use Case Study
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| +-------------------------------------------------------------------------------------+
|
| | Environment                                                                         |
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|
| |  prefix              : cfpdes                                                       |
|
| |  keyword             : cfpdes-2d-p1                                                 |
|
| |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
|
| |  number of processus : 1                                                            |
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| | Materials Properties      |
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|
| |  number of materials : 1  |
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|
| | Meshes                                      |
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|
| | | Mesh : cfpdes-2d-p1                     | |
|
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|
| | |  Discretization : /Mesh/object-3        | |
|
| | | +-------------------------------------+ | |
|
| | | | Import configuration                | | |
|
| | | +-------------------------------------+ | |
|
| | | |  geo-filename          :            | | |
|
| | | |  hsize                 : 1.000000e-01  | | |
|
| | | |  generate-partitioning : 0          | | |
|
| | | +-------------------------------------+ | |
|
| | | +-----------------------------+         | |
|
| | | | Discretization              |         | |
|
| | | +-----------------------------+         | |
|
| | | |  dim         : 2            |         | |
|
| | | |  h_average   : 1.018751e-01 |         | |
|
| | | |  h_max       : 1.168628e-01 |         | |
|
| | | |  h_min       : 8.366122e-02 |         | |
|
| | | |  n_elements  : 248          |         | |
|
| | | |  n_faces     : 392          |         | |
|
| | | |  n_partition : 1            |         | |
|
| | | |  n_points    : 145          |         | |
|
| | | |  order       : 1            |         | |
|
| | | |  real_dim    : 2            |         | |
|
| | | |  shape       : Simplex_2_1_2  |         | |
|
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| | Algebraic Solver                |
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|
| | | Backend          |            |
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|
| | |  prefix : cfpdes  |            |
```

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|
| | |  type   : petsc   |           |
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|
| | | KSP                        |  |
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|
| | |  atol       : 1.000000e-50  |  |
|
| | |  dtol       : 1.000000e+05  |  |
|
| | |  maxit      : 1000          |  |
|
| | |  reuse-prec : 0             |  |
|
| | |  rtol       : 1.000000e-08  |  |
|
| | |  type       : gmres         |  |
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| | +---------------------------+   |
|
| | | SNES                      |   |
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| | +---------------------------+   |
|
| | |  atol      : 1.000000e-50  |   |
|
| | |  maxit     : 50            |   |
|
| | |  reuse-jac : 0             |   |
|
| | |  rtol      : 1.000000e-08  |   |
|
| | |  stol      : 1.000000e-08  |   |
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|
| | | KSP in SNES                |  |
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| | +----------------------------+  |
|
| | |  maxit      : 1000          |  |
|
| | |  reuse-prec : 0             |  |
|
| | |  rtol       : 1.000000e-05  |  |
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|
| | | PC                          | |
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|
| | |  mat-solver-package : mumps  | |
|
| | |  type               : lu     | |
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| | Toolbox Coefficient Form PDE : poisson_eq
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| | +-------------------------------------------------------------------------------------+
| |
| | | Environment                                                                          |
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```

```
| | |  prefix              : cfpdes.poisson_eq                                        |
| |
| | |  keyword             : poisson_eq                                               |
| |
| | |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
| |
| | |  number of processus : 1                                                        |
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| | | Physics
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| | | | poisson_eq
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| | | | | poisson_eq
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| | | | +---------------------------------------------------------------------------------------------------------
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| | | | |  modeling : GenericPDE
| | | | |
| | | | |  type     : poisson_eq
| | | | |
| | | | |  name     : poisson_eq
| | | | |
| | | | | +-------------------------------------------------------------------------------------------------------
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| | | | | | Parameters
| | | | | |
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| | | | | | +------+----------------+--------------------------------+---------------+-------------------------
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| | | | | | | Name | Expression     | Symbol                         | Shape         | Components
| | | | | | |
| | | | | | +======+================+================================+===============+=========================
=========================+ | | | | | |
| | | | | | | c    | {1,0,0,1}      | physics_poisson_eq_poisson_eq_c | tensor2 [2x2] | +-----------------------
------------+---------+ | | | | | | |
| | | | | | | |      |                |                                |               | | Symbol
| Indices | | | | | | | |
| | | | | | | |      |                |                                |               | +=======================
=============+=========+ | | | | | | |
| | | | | | | |      |                |                                |               | | physics_poisson_eq_poi
sson_eq_c_00 | 0,0     | | | | | | | |
| | | | | | | |      |                |                                |               | +-----------------------
------------+---------+ | | | | | | |
| | | | | | | |      |                |                                |               | | physics_poisson_eq_poi
sson_eq_c_01 | 0,1     | | | | | | | |
| | | | | | | |      |                |                                |               | +-----------------------
------------+---------+ | | | | | | |
| | | | | | | |      |                |                                |               | | physics_poisson_eq_poi
sson_eq_c_10 | 1,0     | | | | | | | |
| | | | | | | |      |                |                                |               | +-----------------------
------------+---------+ | | | | | | |
| | | | | | | |      |                |                                |               | | physics_poisson_eq_poi
sson_eq_c_11 | 1,1     | | | | | | | |
| | | | | | | |      |                |                                |               | +-----------------------
------------+---------+ | | | | | | |
| | | | | | +------+----------------+--------------------------------+---------------+-------------------------
-------------------------+ | | | | | |
| | | | | | | f    | -1.0+y^2-2*y*x | physics_poisson_eq_poisson_eq_f | scalar        |
| | | | | | |
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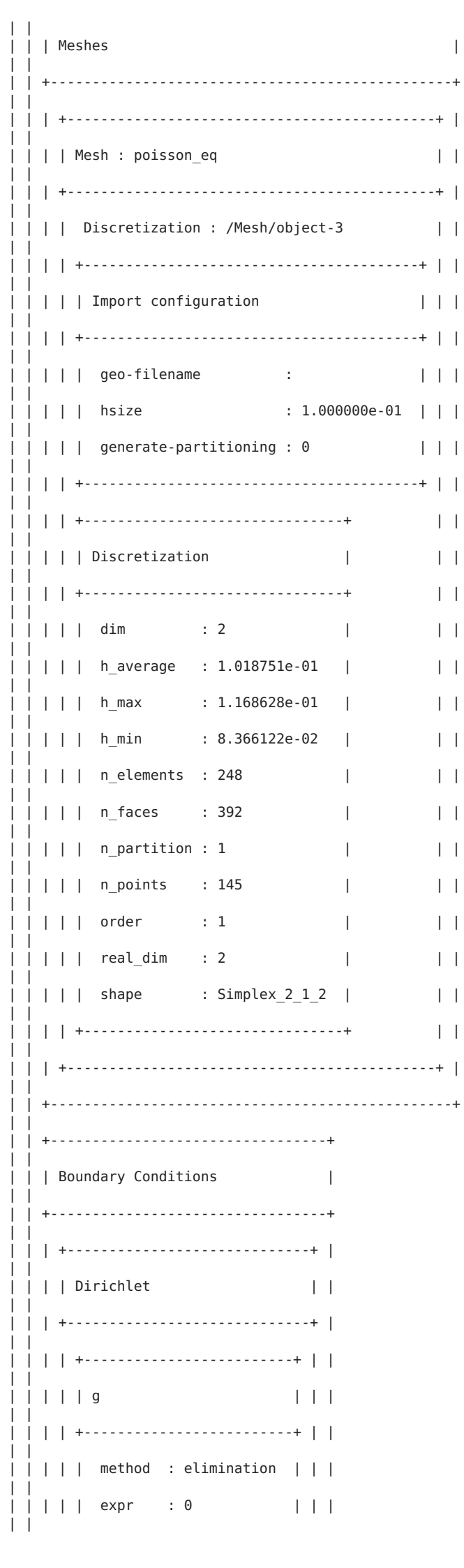
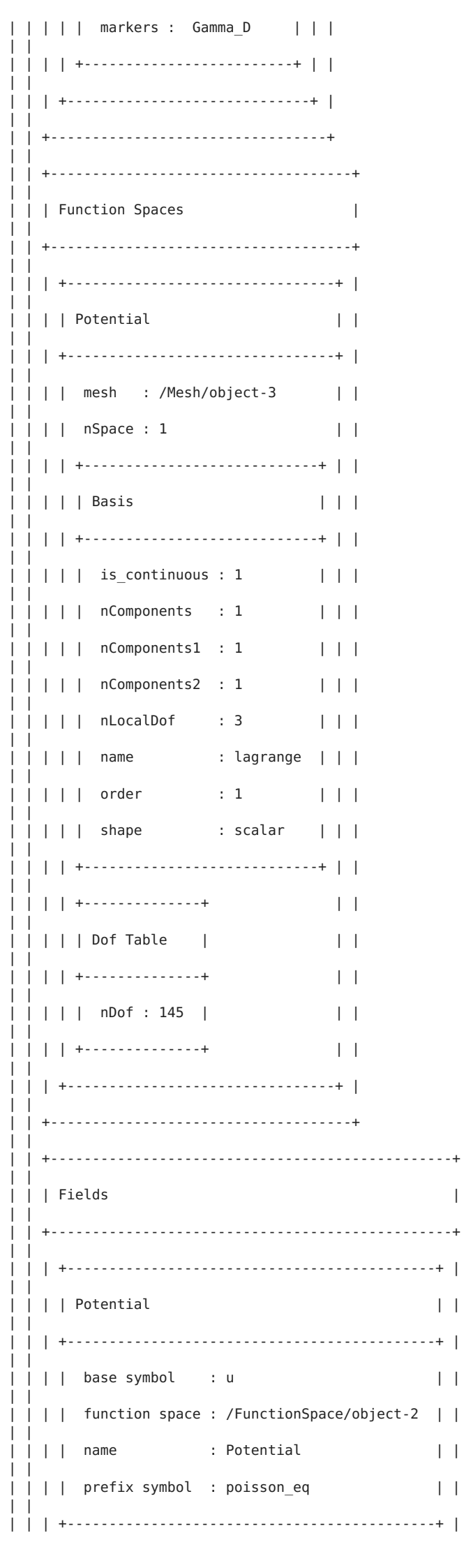

Meshes
Mesh : poisson_eq
Discretization : /Mesh/object-3
Import configuration
geo-filename :
hsize : 1.000000e-01
generate-partitioning : 0
Discretization
dim : 2
h_average : 1.018751e-01
h_max : 1.168628e-01
h_min : 8.366122e-02
n_elements : 248
n_faces : 392
n_partition : 1
n_points : 145
order : 1
real_dim : 2
shape : Simplex_2_1_2
Boundary Conditions
Dirichlet
g
method : elimination
expr : 0


markers : Gamma_D
Function Spaces
Potential
mesh : /Mesh/object-3
nSpace : 1
Basis
is_continuous : 1
nComponents : 1
nComponents1 : 1
nComponents2 : 1
nLocalDof : 3
name : lagrange
order : 1
shape : scalar
Dof Table
nDof : 145
Fields
Potential
base symbol : u
function space : /FunctionSpace/object-2
name : Potential
prefix symbol : poisson_eq

```
| |
| | +-----------------------------------------+ |
| |
| | | Potential_previous                        | |
| |
| | +-----------------------------------------+ |
| |
| | |  base symbol    : u_previous              | |
| |
| | |  function space : /FunctionSpace/object-2 | |
| |
| | |  name           : Potential_previous      | |
| |
| | |  prefix symbol  : poisson_eq              | |
| |
| | +-----------------------------------------+ |
| |
| | +-----------------------------------------+ |
| |
| | | Potential_remove_trial                    | |
| |
| | +-----------------------------------------+ |
| |
| | |  base symbol    : u_rt                    | |
| |
| | |  function space : /FunctionSpace/object-2 | |
| |
| | |  name           : Potential_remove_trial  | |
| |
| | |  prefix symbol  : poisson_eq              | |
| |
| | +-----------------------------------------+ |
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| |
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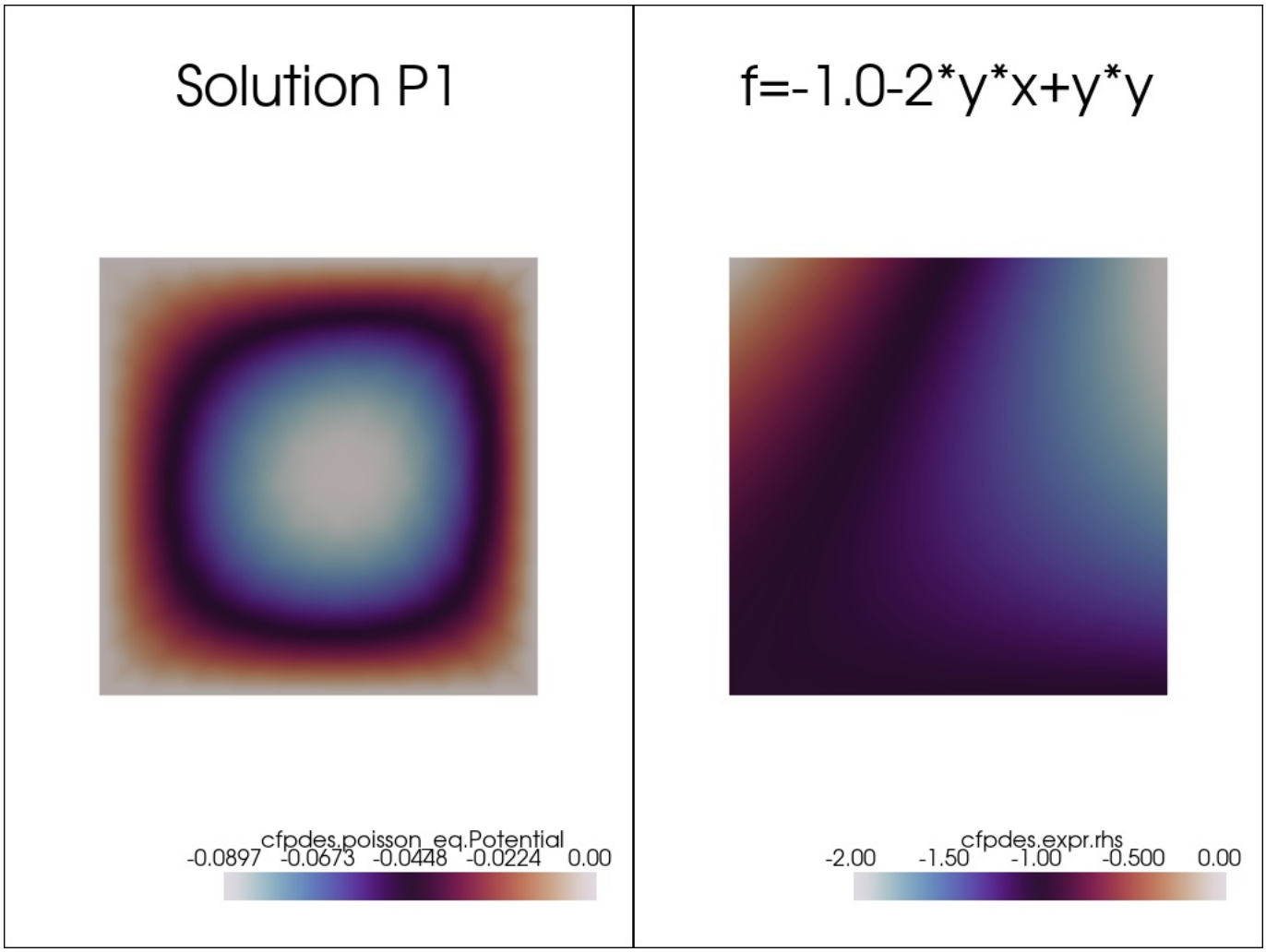
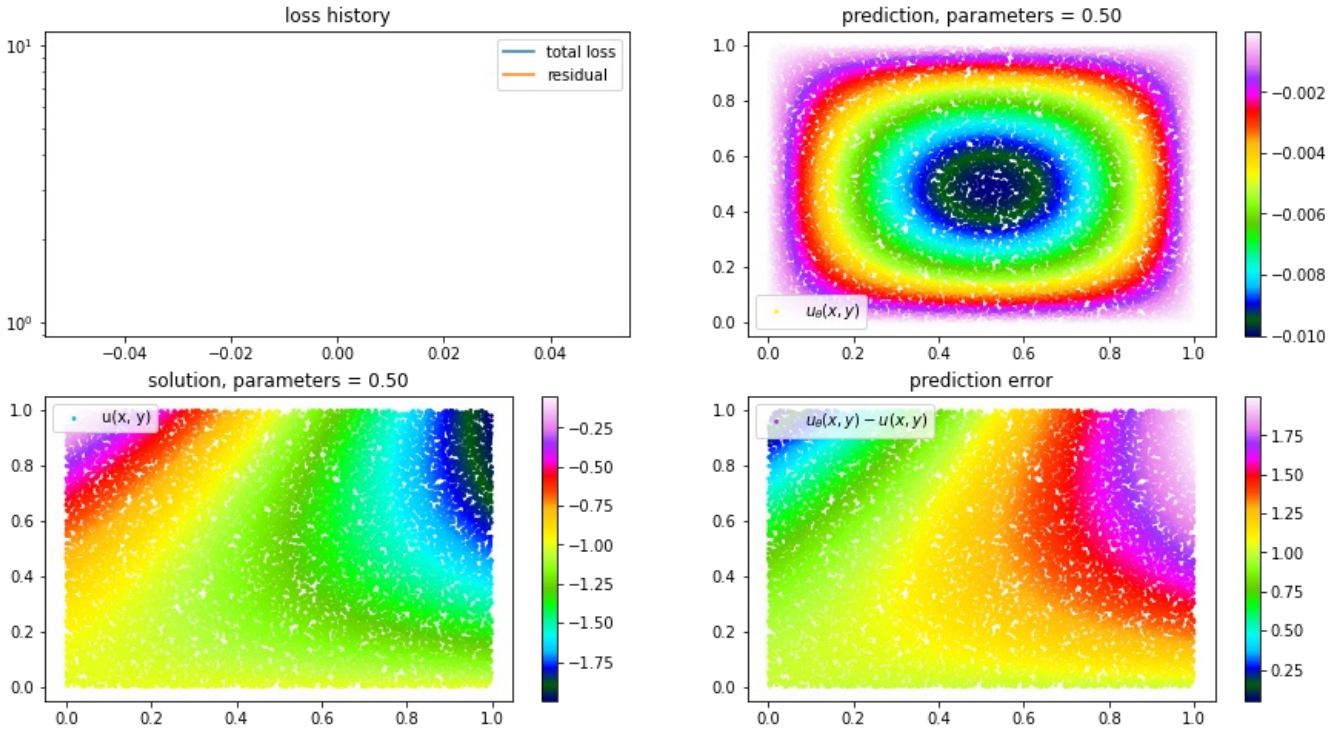
----------------------------------+
```




```
Solving using Scimba
>> load network /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/networks/test.pth
network was not loaded from file: training needed
```




```
Solving the laplacian problem for hsize = 0.1...
[loadMesh] Loading mesh in format geo+msh: "/workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2
.geo"
[loadMesh] Use default geo desc: /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2.geo 0.1
+-----------------------------------------------------------------------------------------------------------------
-----------------------------------+
| Toolbox::cfpdes-2d-p1 - Use Case Study
|
+-----------------------------------------------------------------------------------------------------------------
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| +-------------------------------------------------------------------------------------+
|
| | Environment                                                                         |
|
| +-------------------------------------------------------------------------------------+
|
| |  prefix              : cfpdes                                                       |
|
| |  keyword             : cfpdes-2d-p1                                                 |
|
| |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
|
| |  number of processus : 1                                                            |
|
| +-------------------------------------------------------------------------------------+
|
| +---------------------------+
|
| | Materials Properties      |
|
| +---------------------------+
|
| |  number of materials : 1  |
|
| +---------------------------+
|
| +-----------------------------------------------+
|
| | Meshes                                        |
|
| +-----------------------------------------------+
|
| | +-------------------------------------------+ |
|
| | | Mesh : cfpdes-2d-p1                       | |
|
| | +-------------------------------------------+ |
|
| | |  Discretization : /Mesh/object-5          | |
|
| | | +---------------------------------------+ | |
|
| | | | Import configuration                  | | |
```

```
|
| | +--------------------------------------+ | |
|
| | |  geo-filename          :              | | |
|
| | |  hsize                 : 1.000000e-01  | | |
|
| | |  generate-partitioning : 0             | | |
|
| | +--------------------------------------+ | |
|
| | +------------------------------+         | |
|
| | | Discretization               |         | |
|
| | +------------------------------+         | |
|
| | |  dim         : 2             |         | |
|
| | |  h_average   : 1.018751e-01  |         | |
|
| | |  h_max       : 1.168628e-01  |         | |
|
| | |  h_min       : 8.366122e-02  |         | |
|
| | |  n_elements  : 248           |         | |
|
| | |  n_faces     : 392           |         | |
|
| | |  n_partition : 1             |         | |
|
| | |  n_points    : 145           |         | |
|
| | |  order       : 1             |         | |
|
| | |  real_dim    : 2             |         | |
|
| | |  shape       : Simplex_2_1_2 |         | |
|
| | +------------------------------+         | |
|
| +-----------------------------------------+ |
|
+-------------------------------------------+
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|
| Algebraic Solver                |
|
+---------------------------------+
|
| +-------------------+           |
|
| | Backend           |           |
|
| +-------------------+           |
|
| |  prefix : cfpdes  |           |
|
| |  type   : petsc   |           |
|
| +-------------------+           |
|
| +---------------------------+   |
|
| | KSP                       |   |
|
| +---------------------------+   |
|
| |  atol       : 1.000000e-50  |   |
|
| |  dtol       : 1.000000e+05  |   |
|
| |  maxit      : 1000          |   |
|
| |  reuse-prec : 0             |   |
|
| |  rtol       : 1.000000e-08  |   |
|
| |  type       : gmres         |   |
|
| +---------------------------+   |
|
```

```
| | +---------------------------+   |
|
| | | SNES                      |   |
|
| | +---------------------------+   |
|
| | |  atol      : 1.000000e-50  |   |
|
| | |  maxit     : 50            |   |
|
| | |  reuse-jac : 0             |   |
|
| | |  rtol      : 1.000000e-08  |   |
|
| | |  stol      : 1.000000e-08  |   |
|
| | +---------------------------+   |
|
| | +----------------------------+  |
|
| | | KSP in SNES                |  |
|
| | +----------------------------+  |
|
| | |  maxit      : 1000         |  |
|
| | |  reuse-prec : 0            |  |
|
| | |  rtol       : 1.000000e-05  |  |
|
| | +----------------------------+  |
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| | +-----------------------------+ |
|
| | | PC                           | |
|
| | +-----------------------------+ |
|
| | |  mat-solver-package : mumps  | |
|
| | |  type               : lu     | |
|
| | +-----------------------------+ |
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| +---------------------------------+
|
| +-------------------------------------------------------------------------------------------------------------------
---------------------------------+ |
| | Toolbox Coefficient Form PDE : poisson_eq
| |
| +-------------------------------------------------------------------------------------------------------------------
---------------------------------+ |
| | +-------------------------------------------------------------------------------------+
| |
| | | Environment                                                                         |
| |
| | +-------------------------------------------------------------------------------------+
| |
| | |  prefix              : cfpdes.poisson_eq                                            |
| |
| | |  keyword             : poisson_eq                                                   |
| |
| | |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
| |
| | |  number of processus : 1                                                            |
| |
| | +-------------------------------------------------------------------------------------+
| |
| | +-------------------------------------------------------------------------------------------------------------------
---------------------------------+ | |
| | | Physics
| | |
| | +-------------------------------------------------------------------------------------------------------------------
---------------------------------+ | |
| | | +-----------------------------------------------------------------------------------------------------------------
-----------------------------+ | | |
| | | | poisson_eq
| | | |
| | | +-----------------------------------------------------------------------------------------------------------------
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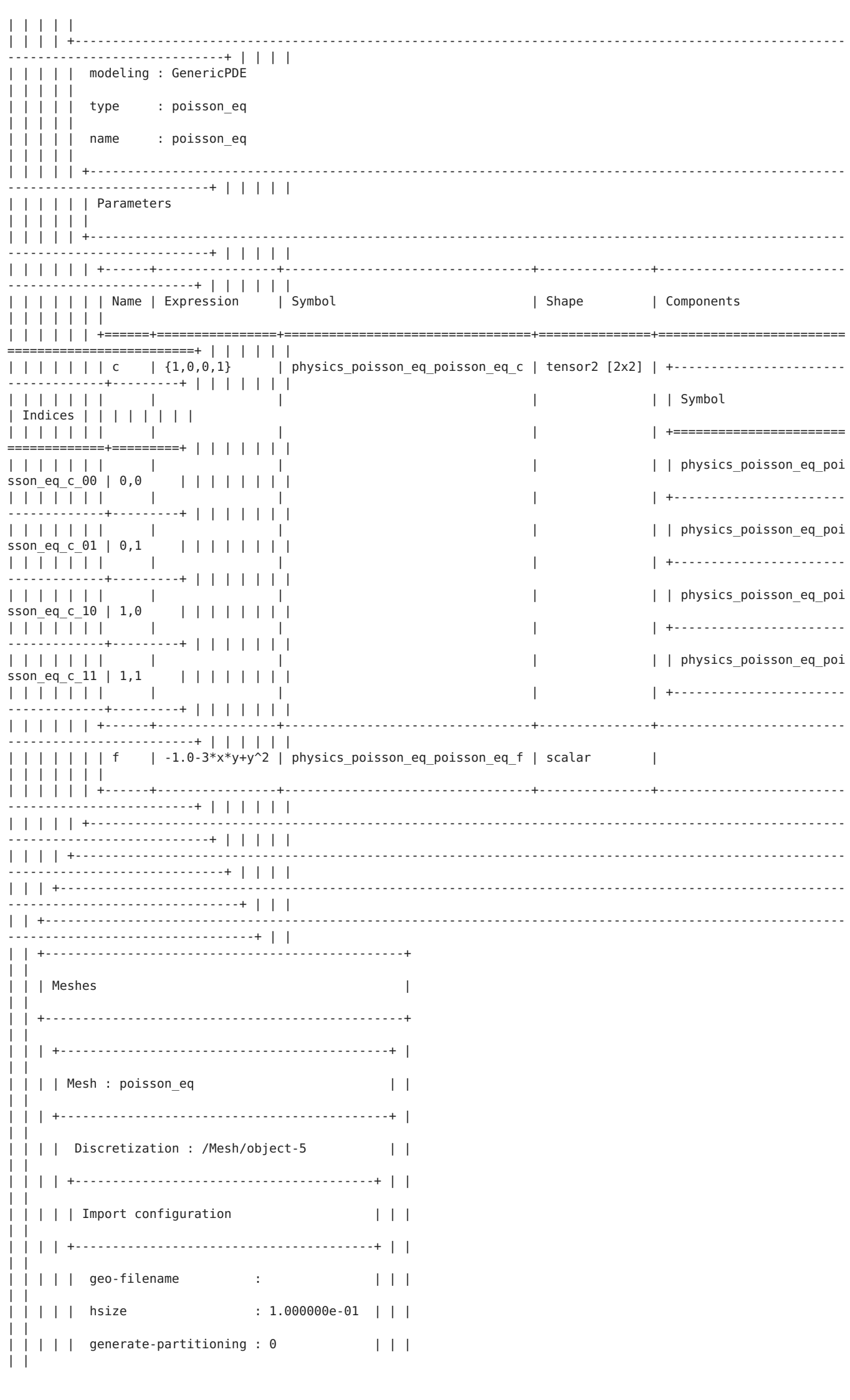
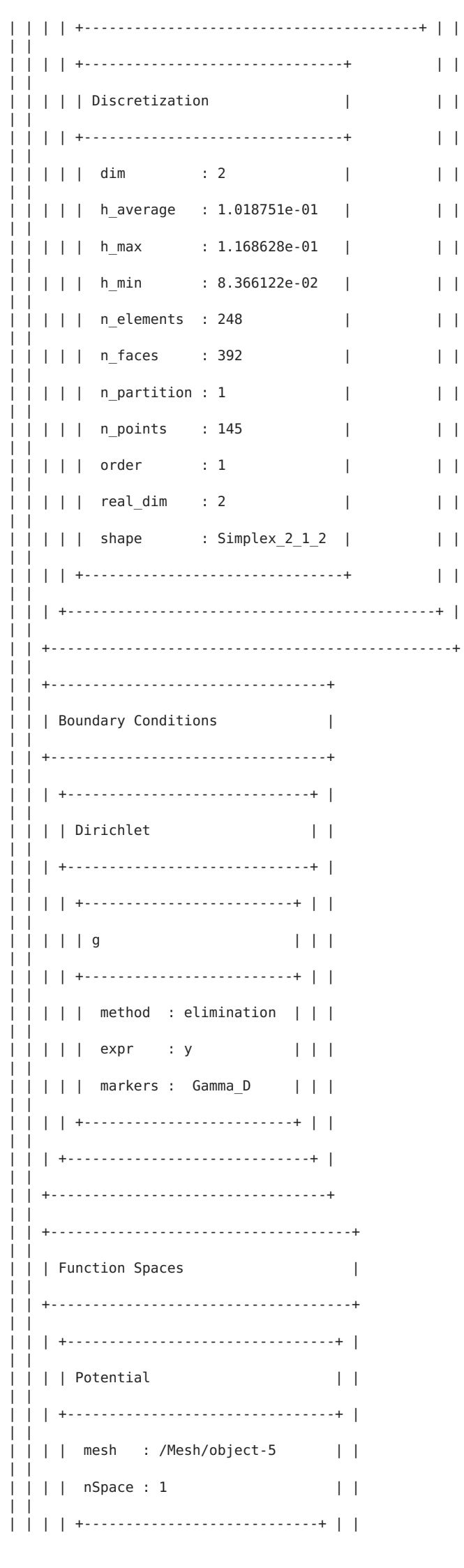
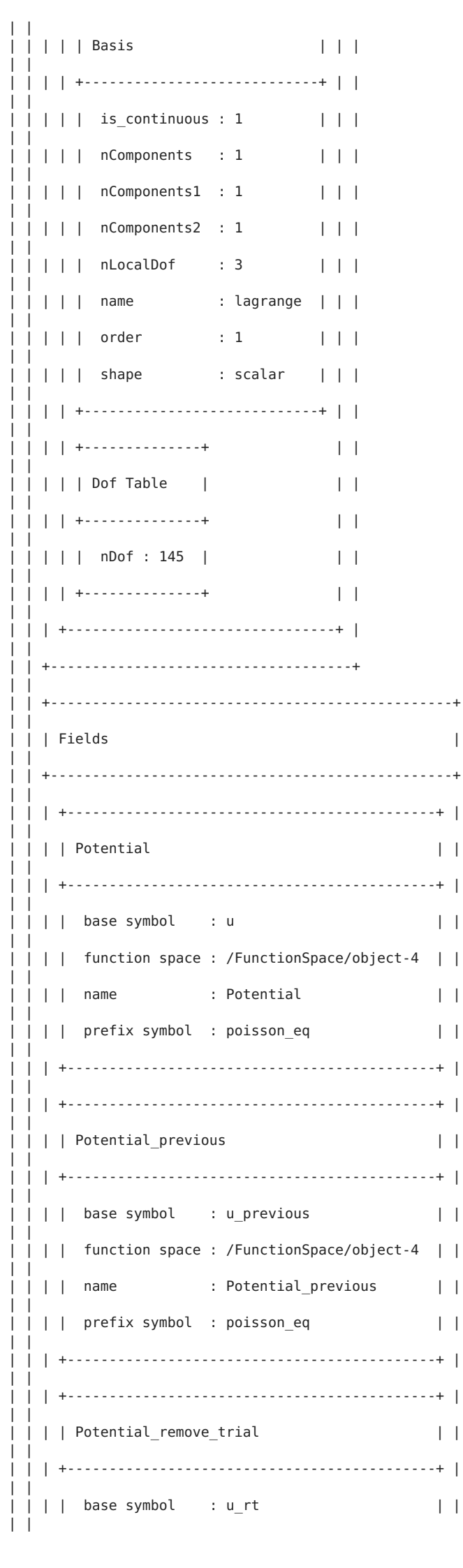
| | | +---------------------------------------------------------------------------------------------------------------
---------------------------+ | | | |
| | | | poisson_eq
```


modeling : GenericPDE
type : poisson_eq
name : poisson_eq
Parameters
Name | Expression | Symbol | Shape | Components
c | {1,0,0,1} | physics_poisson_eq_poisson_eq_c | tensor2 [2x2] | Symbol
Indices
physics_poisson_eq_poisson_eq_c_00 | 0,0
physics_poisson_eq_poisson_eq_c_01 | 0,1
physics_poisson_eq_poisson_eq_c_10 | 1,0
physics_poisson_eq_poisson_eq_c_11 | 1,1
f | -1.0-3*x*y+y^2 | physics_poisson_eq_poisson_eq_f | scalar
Meshes
Mesh : poisson_eq
Discretization : /Mesh/object-5
Import configuration
geo-filename :
hsize : 1.000000e-01
generate-partitioning : 0


Discretization
dim : 2
h_average : 1.018751e-01
h_max : 1.168628e-01
h_min : 8.366122e-02
n_elements : 248
n_faces : 392
n_partition : 1
n_points : 145
order : 1
real_dim : 2
shape : Simplex_2_1_2
Boundary Conditions
Dirichlet
g
method : elimination
expr : y
markers : Gamma_D
Function Spaces
Potential
mesh : /Mesh/object-5
nSpace : 1


Basis
is_continuous : 1
nComponents : 1
nComponents1 : 1
nComponents2 : 1
nLocalDof : 3
name : lagrange
order : 1
shape : scalar
Dof Table
nDof : 145
Fields
Potential
base symbol : u
function space : /FunctionSpace/object-4
name : Potential
prefix symbol : poisson_eq
Potential_previous
base symbol : u_previous
function space : /FunctionSpace/object-4
name : Potential_previous
prefix symbol : poisson_eq
Potential_remove_trial
base symbol : u_rt

```
| | | |  function space : /FunctionSpace/object-4  | |
| |
| | | |  name           : Potential_remove_trial   | |
| |
| | | |  prefix symbol  : poisson_eq               | |
| |
| | | +-------------------------------------------+ |
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| | +-----------------------------------------------+
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| +-------------------------------------------------------------------------------------------------------------------
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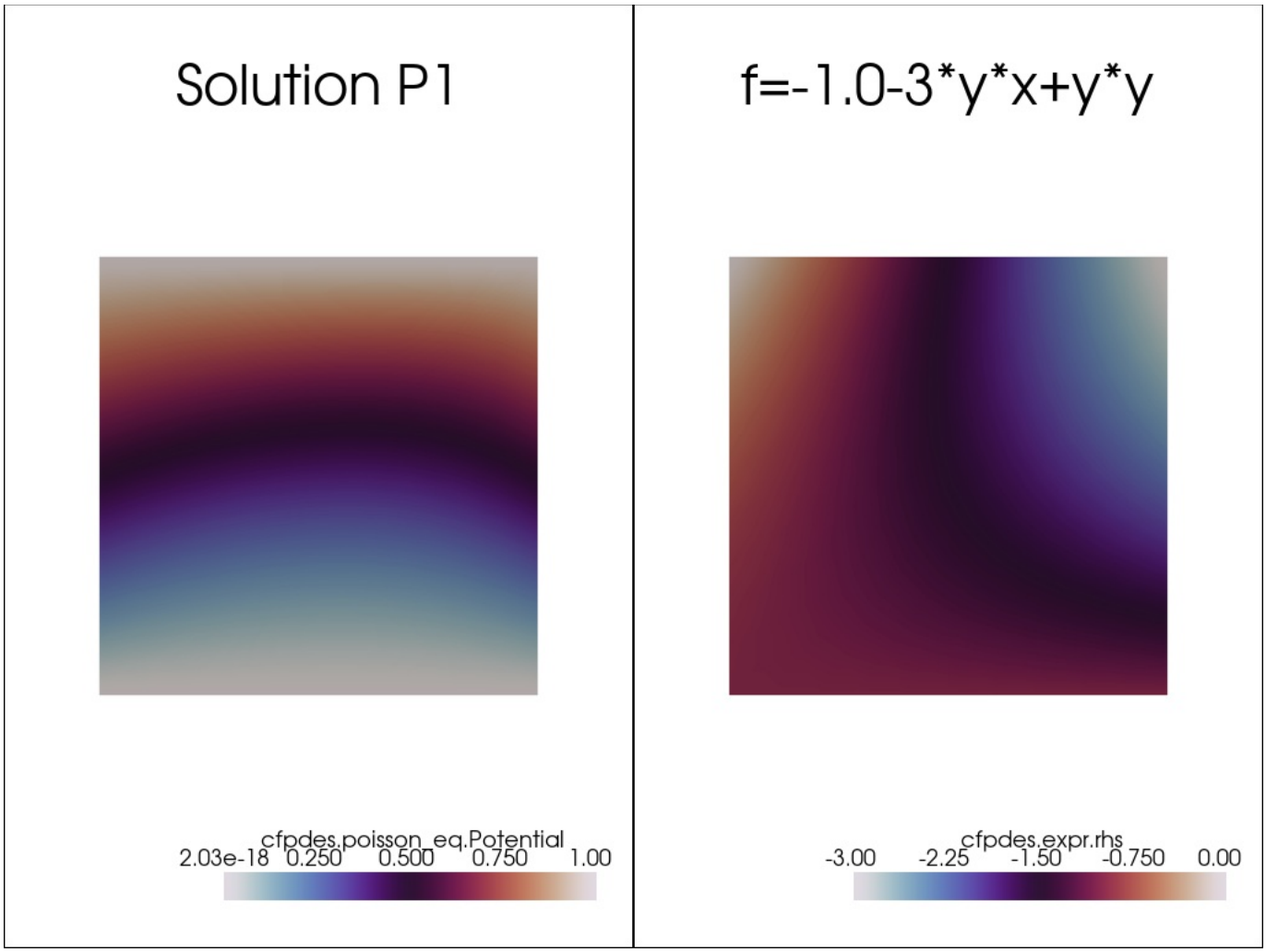
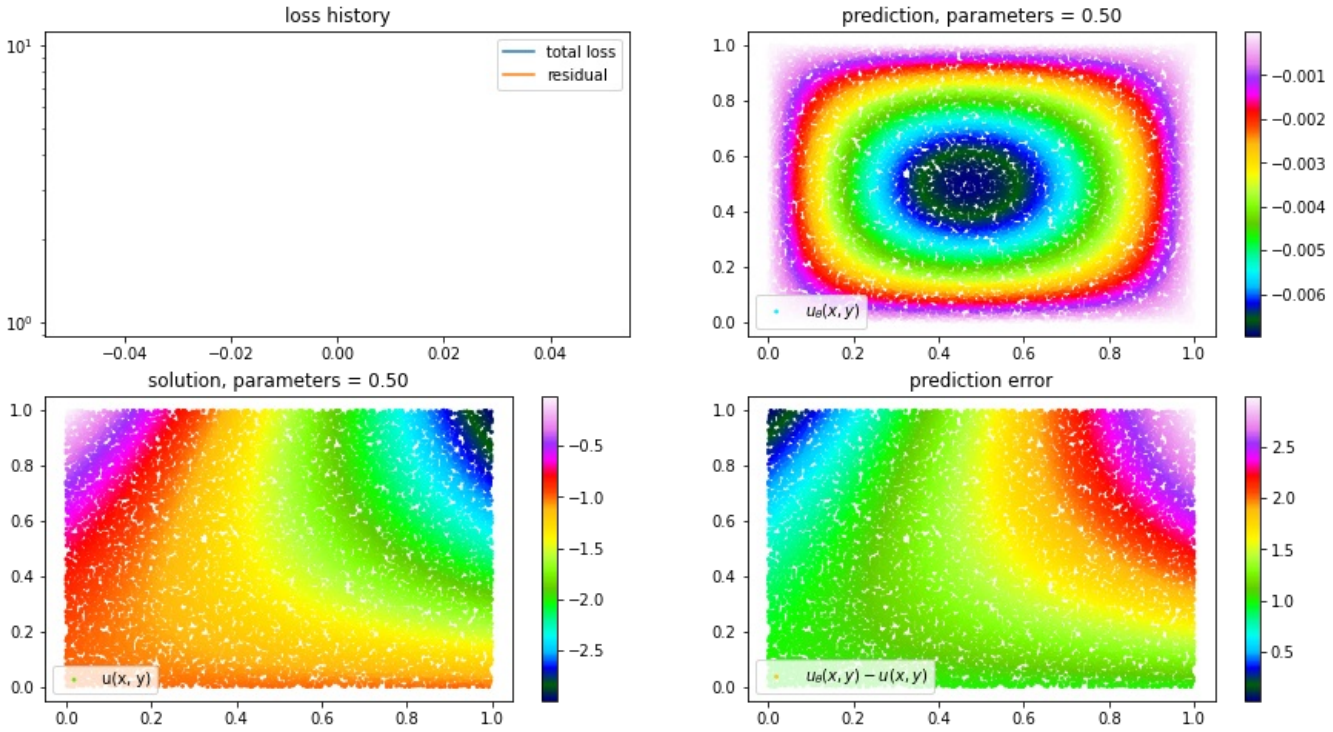
```




```
Solving using Scimba
>> load network /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/networks/test.pth
network was not loaded from file: training needed
```




```
Solving the laplacian problem for hsize = 0.1...
[loadMesh] Loading mesh in format geo+msh: "/workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2
.geo"
[loadMesh] Use default geo desc: /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2.geo 0.1
+-----------------------------------------------------------------------------------------------------------------
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| Toolbox::cfpdes-2d-p1 - Use Case Study
|
+-----------------------------------------------------------------------------------------------------------------
-----------------------------------+
| +-------------------------------------------------------------------------------------+
|
| | Environment                                                                         |
|
| +-------------------------------------------------------------------------------------+
|
| |  prefix              : cfpdes                                                       |
|
| |  keyword             : cfpdes-2d-p1                                                 |
|
| |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
|
| |  number of processus : 1                                                            |
|
| +-------------------------------------------------------------------------------------+
|
| +--------------------------+
|
```

```
| | Materials Properties      |
|
| +--------------------------+
|
| |  number of materials : 1  |
|
| +--------------------------+
|
| +---------------------------------------------+
|
| | Meshes                                      |
|
| +---------------------------------------------+
|
| | +-----------------------------------------+ |
|
| | | Mesh : cfpdes-2d-p1                     | |
|
| | +-----------------------------------------+ |
|
| | |  Discretization : /Mesh/object-7        | |
|
| | | +-------------------------------------+ | |
|
| | | | Import configuration                | | |
|
| | | +-------------------------------------+ | |
|
| | | |  geo-filename          :            | | |
|
| | | |  hsize                 : 1.000000e-01  | | |
|
| | | |  generate-partitioning : 0          | | |
|
| | | +-------------------------------------+ | |
|
| | | +-----------------------------+         | |
|
| | | | Discretization              |         | |
|
| | | +-----------------------------+         | |
|
| | | |  dim         : 2            |         | |
|
| | | |  h_average   : 1.018751e-01 |         | |
|
| | | |  h_max       : 1.168628e-01 |         | |
|
| | | |  h_min       : 8.366122e-02 |         | |
|
| | | |  n_elements  : 248          |         | |
|
| | | |  n_faces     : 392          |         | |
|
| | | |  n_partition : 1            |         | |
|
| | | |  n_points    : 145          |         | |
|
| | | |  order       : 1            |         | |
|
| | | |  real_dim    : 2            |         | |
|
| | | |  shape       : Simplex_2_1_2  |         | |
|
| | | +-----------------------------+         | |
|
| | +-----------------------------------------+ |
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| +---------------------------------+
|
| | Algebraic Solver                |
|
| +---------------------------------+
|
| | +------------------+            |
|
| | | Backend          |            |
|
| | +------------------+            |
|
| | |  prefix : cfpdes  |            |
```

```
|
| | |  type   : petsc   |           |
|
| | +-------------------+           |
|
| | +----------------------------+  |
|
| | | KSP                        |  |
|
| | +----------------------------+  |
|
| | |  atol       : 1.000000e-50  |  |
|
| | |  dtol       : 1.000000e+05  |  |
|
| | |  maxit      : 1000          |  |
|
| | |  reuse-prec : 0             |  |
|
| | |  rtol       : 1.000000e-08  |  |
|
| | |  type       : gmres         |  |
|
| | +----------------------------+  |
|
| | +---------------------------+   |
|
| | | SNES                      |   |
|
| | +---------------------------+   |
|
| | |  atol      : 1.000000e-50  |   |
|
| | |  maxit     : 50            |   |
|
| | |  reuse-jac : 0             |   |
|
| | |  rtol      : 1.000000e-08  |   |
|
| | |  stol      : 1.000000e-08  |   |
|
| | +---------------------------+   |
|
| | +----------------------------+  |
|
| | | KSP in SNES                |  |
|
| | +----------------------------+  |
|
| | |  maxit      : 1000          |  |
|
| | |  reuse-prec : 0             |  |
|
| | |  rtol       : 1.000000e-05  |  |
|
| | +----------------------------+  |
|
| | +-----------------------------+ |
|
| | | PC                          | |
|
| | +-----------------------------+ |
|
| | |  mat-solver-package : mumps  | |
|
| | |  type               : lu     | |
|
| | +-----------------------------+ |
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| +---------------------------------+
|
| +-------------------------------------------------------------------------------------------------------------------
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| | Toolbox Coefficient Form PDE : poisson_eq
| |
| +-------------------------------------------------------------------------------------------------------------------
---------------------------------+ |
| | +-------------------------------------------------------------------------------------+
| |
| | | Environment                                                                          |
| |
| | +-------------------------------------------------------------------------------------+
| |
```

```
| | |  prefix              : cfpdes.poisson_eq                                        |
| |
| | |  keyword             : poisson_eq                                               |
| |
| | |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
| |
| | |  number of processus : 1                                                        |
| |
| | +--------------------------------------------------------------------------------+
| |
| | +-------------------------------------------------------------------------------------------------------------
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| | | Physics
| | |
| | +-------------------------------------------------------------------------------------------------------------
---------------------------------+ | |
| | | +-----------------------------------------------------------------------------------------------------------
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| | | | poisson_eq
| | | |
| | | +-----------------------------------------------------------------------------------------------------------
-----------------------------+ | | |
| | | | +-------------------------------------------------------------------------------------------------------
-----------------------------+ | | | |
| | | | | poisson_eq
| | | | |
| | | | +-------------------------------------------------------------------------------------------------------
-----------------------------+ | | | |
| | | | |  modeling : GenericPDE
| | | | |
| | | | |  type     : poisson_eq
| | | | |
| | | | |  name     : poisson_eq
| | | | |
| | | | | +-----------------------------------------------------------------------------------------------------
---------------------------+ | | | | |
| | | | | | Parameters
| | | | | |
| | | | | +-----------------------------------------------------------------------------------------------------
---------------------------+ | | | | |
| | | | | | +------+----------------+---------------------------------+---------------+-------------------------
-------------------------+ | | | | | |
| | | | | | | Name | Expression     | Symbol                          | Shape         | Components
| | | | | | |
| | | | | | +======+================+=================================+===============+=========================
=========================+ | | | | | |
| | | | | | | c    | {1,0,0,1}      | physics_poisson_eq_poisson_eq_c | tensor2 [2x2] | +-----------------------
-------------+---------+ | | | | | | |
| | | | | | | |      |                |                                 |               | | Symbol
| Indices | | | | | | | |
| | | | | | | |      |                |                                 |               | +=======================
=============+=========+ | | | | | | |
| | | | | | | |      |                |                                 |               | | physics_poisson_eq_poi
sson_eq_c_00 | 0,0     | | | | | | | |
| | | | | | | |      |                |                                 |               | +-----------------------
-------------+---------+ | | | | | | |
| | | | | | | |      |                |                                 |               | | physics_poisson_eq_poi
sson_eq_c_01 | 0,1     | | | | | | | |
| | | | | | | |      |                |                                 |               | +-----------------------
-------------+---------+ | | | | | | |
| | | | | | | |      |                |                                 |               | | physics_poisson_eq_poi
sson_eq_c_10 | 1,0     | | | | | | | |
| | | | | | | |      |                |                                 |               | +-----------------------
-------------+---------+ | | | | | | |
| | | | | | | |      |                |                                 |               | | physics_poisson_eq_poi
sson_eq_c_11 | 1,1     | | | | | | | |
| | | | | | | |      |                |                                 |               | +-----------------------
-------------+---------+ | | | | | | |
| | | | | | +------+----------------+---------------------------------+---------------+-------------------------
-------------------------+ | | | | | |
| | | | | | | f    | -1.0+y^2-4*x*y | physics_poisson_eq_poisson_eq_f | scalar        |
| | | | | | |
| | | | | | +------+----------------+---------------------------------+---------------+-------------------------
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| | | | | +-----------------------------------------------------------------------------------------------------
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| | | | +-------------------------------------------------------------------------------------------------------
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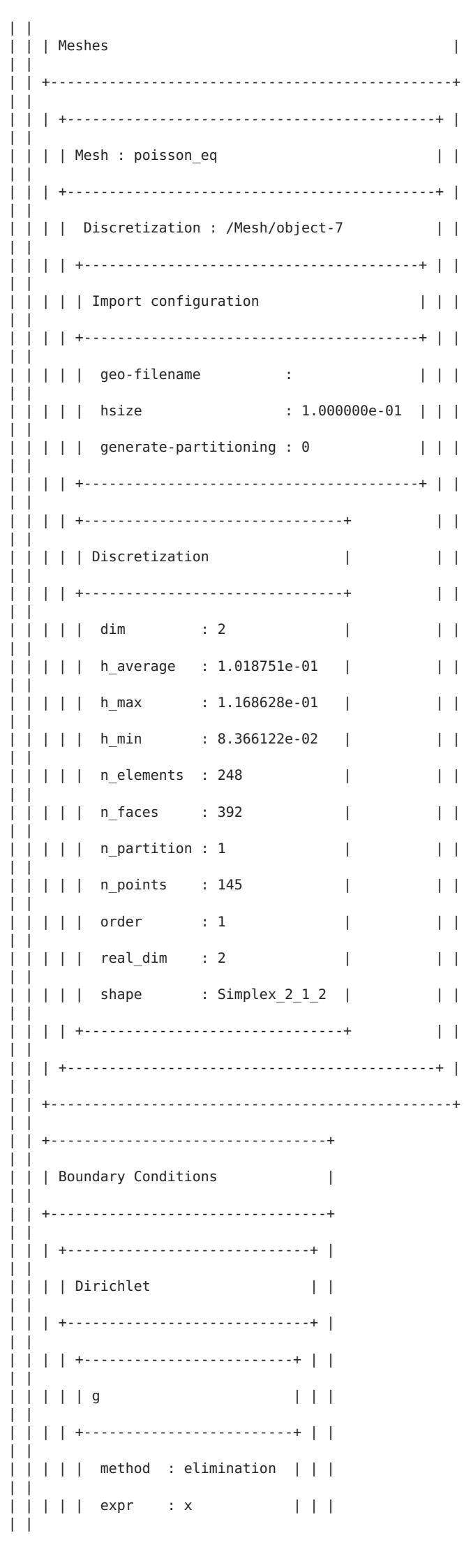
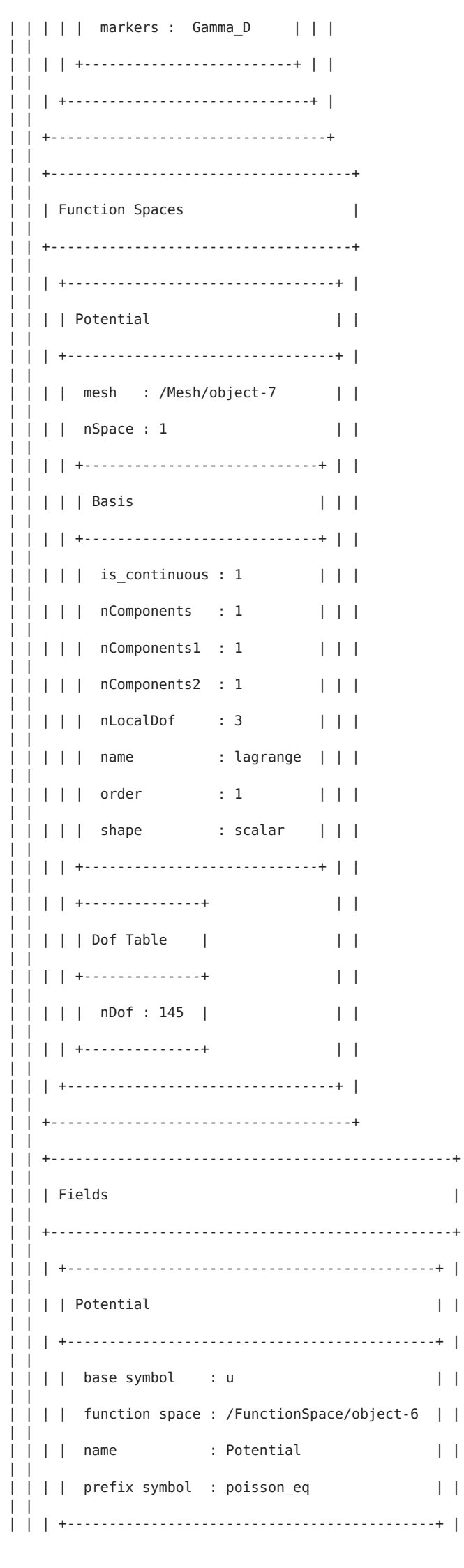
| | +-----------------------------------------------+
```


Meshes
Mesh : poisson_eq
Discretization : /Mesh/object-7
Import configuration
geo-filename :
hsize : 1.000000e-01
generate-partitioning : 0
Discretization
dim : 2
h_average : 1.018751e-01
h_max : 1.168628e-01
h_min : 8.366122e-02
n_elements : 248
n_faces : 392
n_partition : 1
n_points : 145
order : 1
real_dim : 2
shape : Simplex_2_1_2
Boundary Conditions
Dirichlet
g
method : elimination
expr : x


markers : Gamma_D
Function Spaces
Potential
mesh : /Mesh/object-7
nSpace : 1
Basis
is_continuous : 1
nComponents : 1
nComponents1 : 1
nComponents2 : 1
nLocalDof : 3
name : lagrange
order : 1
shape : scalar
Dof Table
nDof : 145
Fields
Potential
base symbol : u
function space : /FunctionSpace/object-6
name : Potential
prefix symbol : poisson_eq

```
| |
| | +-----------------------------------------+ |
| |
| | | Potential_previous                        | |
| |
| | +-----------------------------------------+ |
| |
| | |  base symbol    : u_previous              | |
| |
| | |  function space : /FunctionSpace/object-6 | |
| |
| | |  name           : Potential_previous      | |
| |
| | |  prefix symbol  : poisson_eq              | |
| |
| | +-----------------------------------------+ |
| |
| | +-----------------------------------------+ |
| |
| | | Potential_remove_trial                    | |
| |
| | +-----------------------------------------+ |
| |
| | |  base symbol    : u_rt                    | |
| |
| | |  function space : /FunctionSpace/object-6 | |
| |
| | |  name           : Potential_remove_trial  | |
| |
| | |  prefix symbol  : poisson_eq              | |
| |
| | +-----------------------------------------+ |
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| +-------------------------------------------------------------------------------------------------------------------
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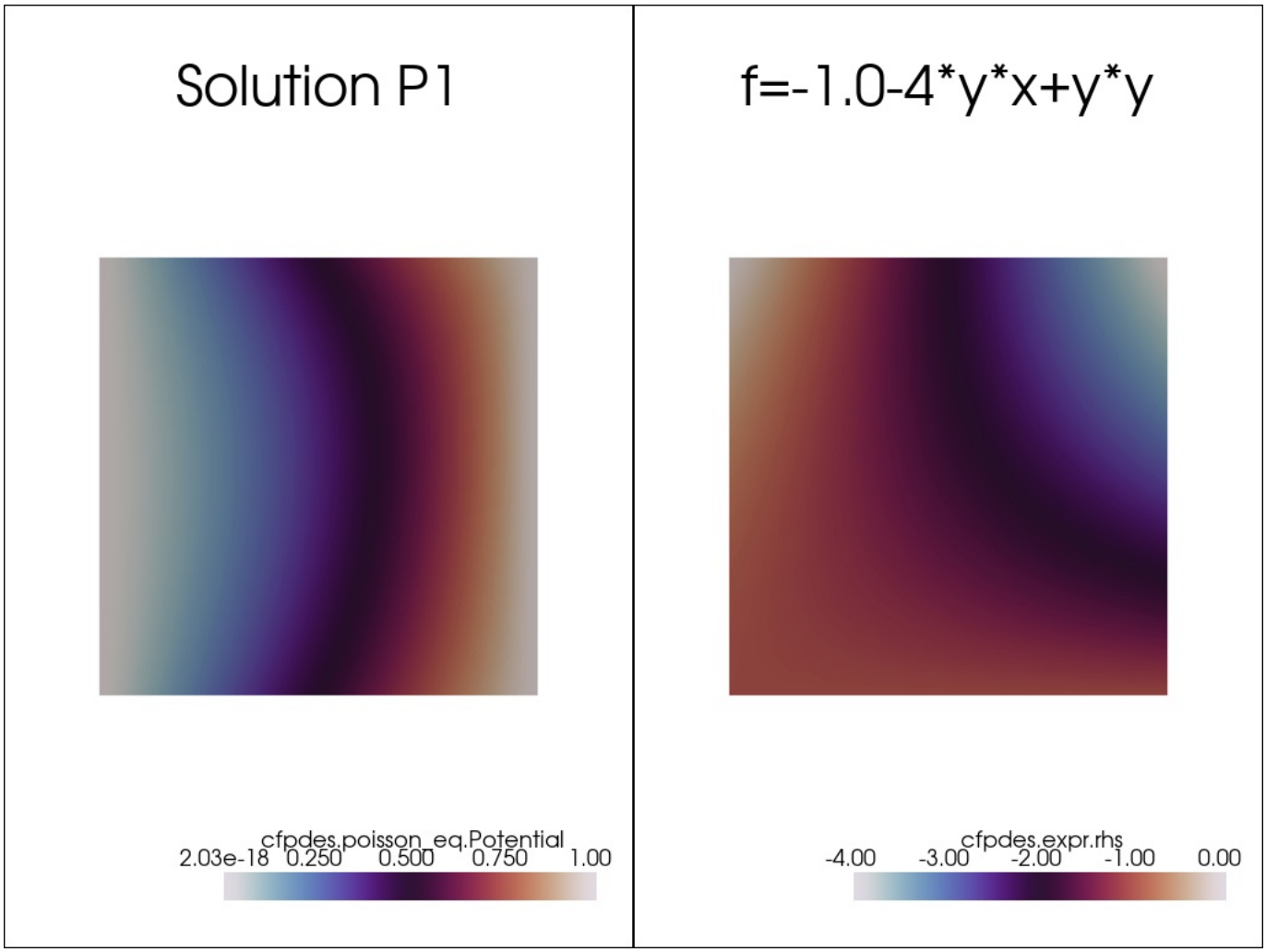
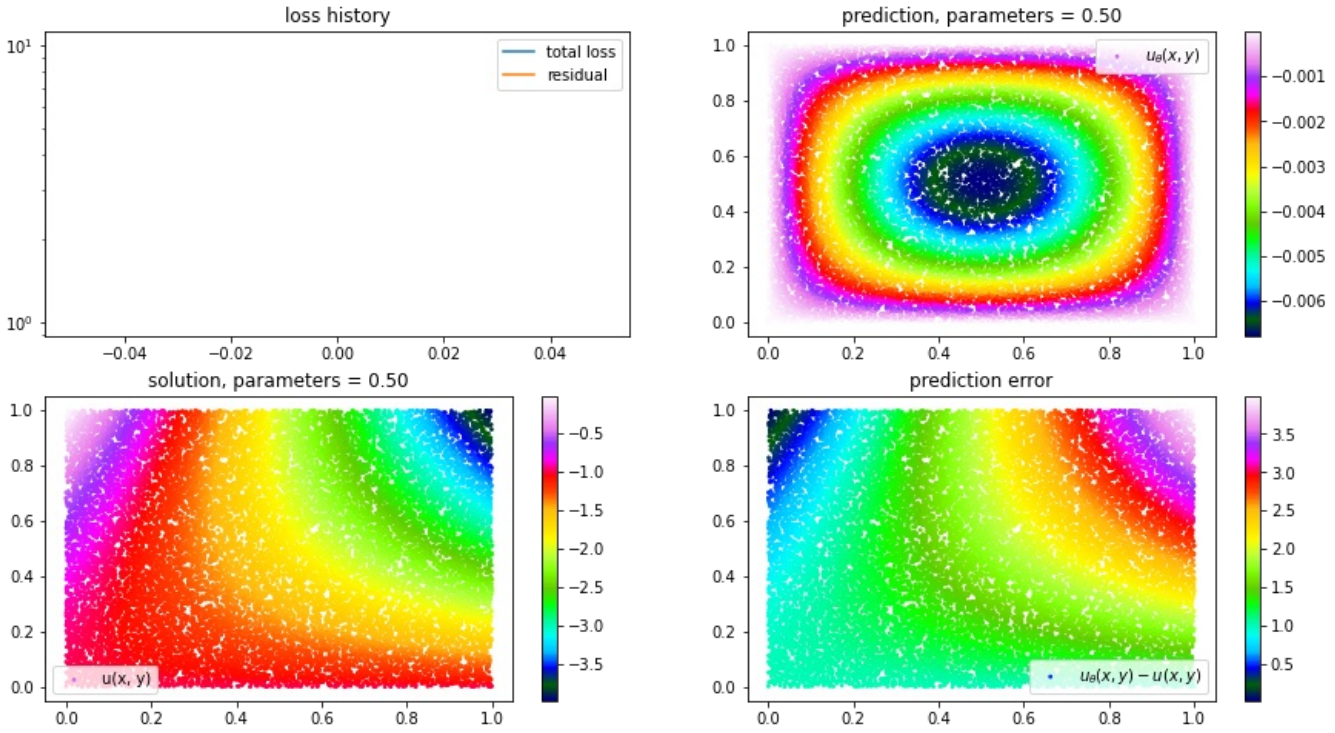
```




```
Solving using Scimba
>> load network /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/networks/test.pth
network was not loaded from file: training needed
```




```
Solving the laplacian problem for hsize = 0.05...
[loadMesh] Loading mesh in format geo+msh: "/workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2
.geo"
[loadMesh] Use default geo desc: /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2.geo 0.05
+-----------------------------------------------------------------------------------------------------------------
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| Toolbox::cfpdes-2d-p1 - Use Case Study
|
+-----------------------------------------------------------------------------------------------------------------
---------------------------------+
| +-------------------------------------------------------------------------------------+
|
| | Environment                                                                       |
|
| +-------------------------------------------------------------------------------------+
|
| |  prefix              : cfpdes                                                     |
|
| |  keyword             : cfpdes-2d-p1                                               |
|
| |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
|
| |  number of processus : 1                                                          |
|
| +-------------------------------------------------------------------------------------+
|
| +---------------------------+
|
| | Materials Properties      |
|
| +---------------------------+
|
| |  number of materials : 1  |
|
| +---------------------------+
|
| +-----------------------------------------------+
|
| | Meshes                                        |
|
| +-----------------------------------------------+
|
| | +-------------------------------------------+ |
|
| | | Mesh : cfpdes-2d-p1                       | |
|
| | +-------------------------------------------+ |
|
| | |  Discretization : /Mesh/object-9          | |
|
| | | +---------------------------------------+ | |
|
| | | | Import configuration                  | | |
```

```
|
| | +--------------------------------------+ | |
|
| | |  geo-filename          :              | | |
|
| | |  hsize                 : 1.000000e-01  | | |
|
| | |  generate-partitioning : 0             | | |
|
| | +--------------------------------------+ | |
|
| | +------------------------------+         | |
|
| | | Discretization               |         | |
|
| | +------------------------------+         | |
|
| | |  dim         : 2             |         | |
|
| | |  h_average   : 5.095217e-02  |         | |
|
| | |  h_max       : 6.887751e-02  |         | |
|
| | |  h_min       : 4.286120e-02  |         | |
|
| | |  n_elements  : 952           |         | |
|
| | |  n_faces     : 1468          |         | |
|
| | |  n_partition : 1             |         | |
|
| | |  n_points    : 517           |         | |
|
| | |  order       : 1             |         | |
|
| | |  real_dim    : 2             |         | |
|
| | |  shape       : Simplex_2_1_2 |         | |
|
| | +------------------------------+         | |
|
| +-----------------------------------------+ |
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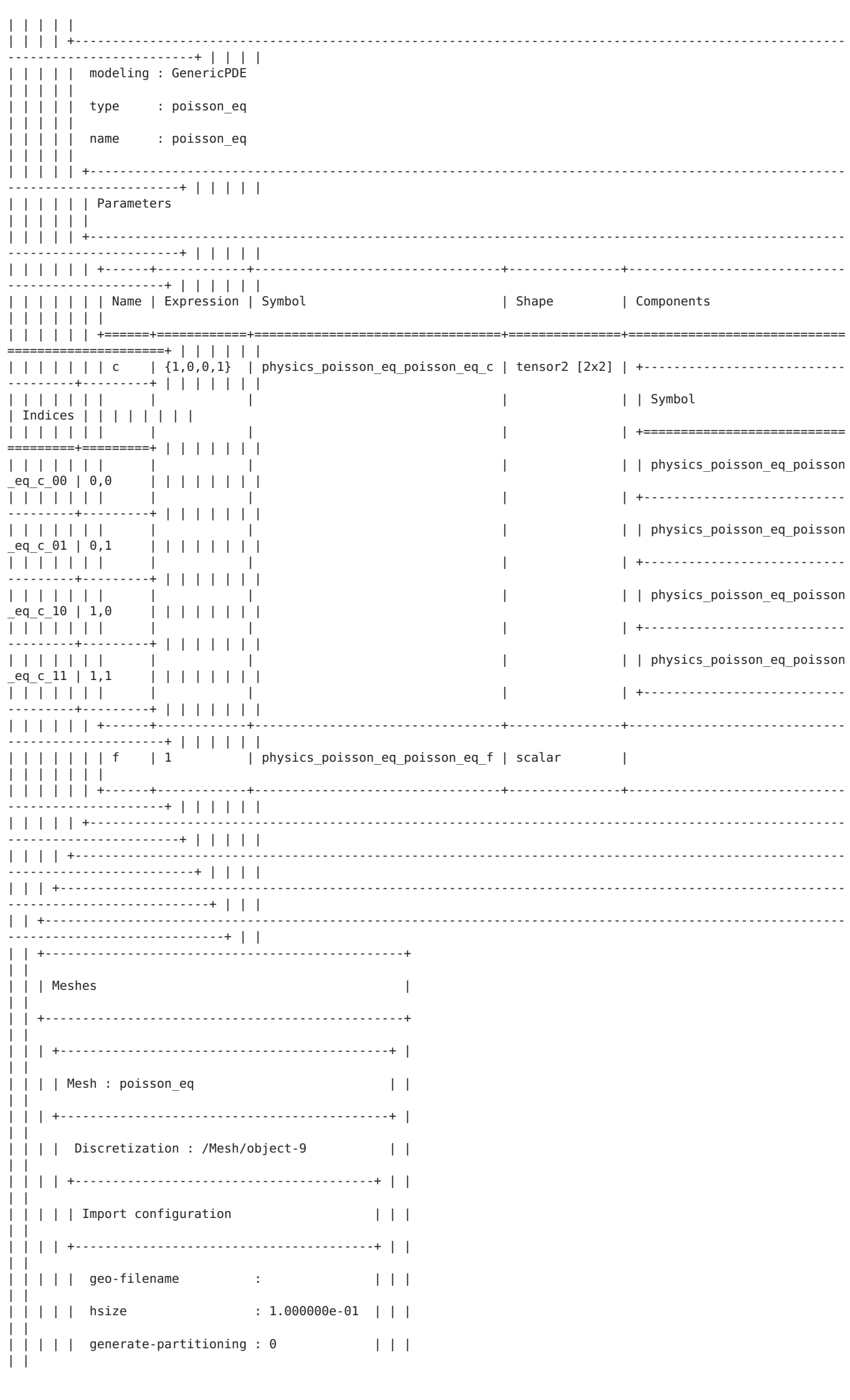
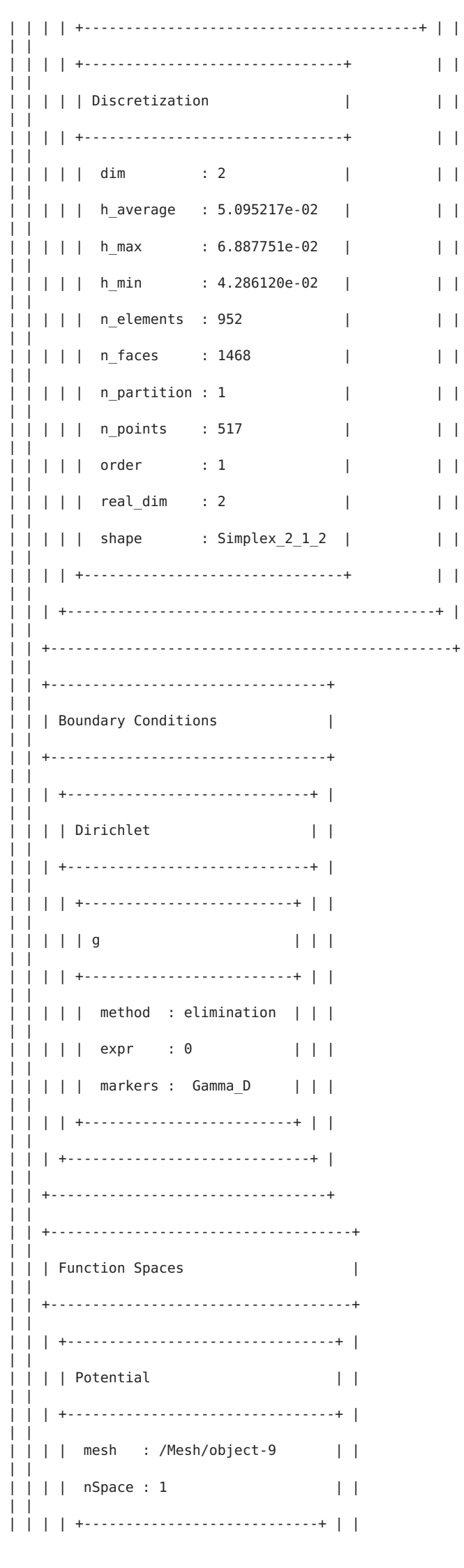
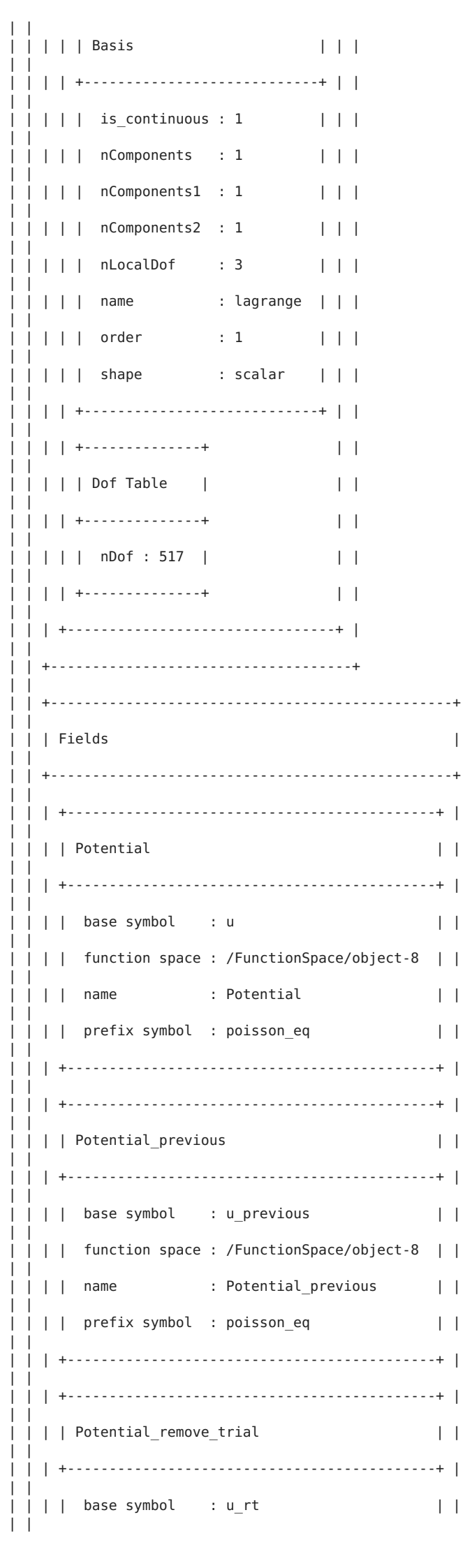
|
| Algebraic Solver                |
|
+---------------------------------+
|
| +------------------+            |
|
| | Backend          |            |
|
| +------------------+            |
|
| |  prefix : cfpdes |            |
|
| |  type   : petsc  |            |
|
| +------------------+            |
|
| +----------------------------+  |
|
| | KSP                        |  |
|
| +----------------------------+  |
|
| |  atol       : 1.000000e-50 |  |
|
| |  dtol       : 1.000000e+05 |  |
|
| |  maxit      : 1000         |  |
|
| |  reuse-prec : 0            |  |
|
| |  rtol       : 1.000000e-08 |  |
|
| |  type       : gmres        |  |
|
| +----------------------------+  |
|
```


SNES
atol : 1.000000e-50
maxit : 50
reuse-jac : 0
rtol : 1.000000e-08
stol : 1.000000e-08
KSP in SNES
maxit : 1000
reuse-prec : 0
rtol : 1.000000e-05
PC
mat-solver-package : mumps
type : lu
Toolbox Coefficient Form PDE : poisson_eq
Environment
prefix : cfpdes.poisson_eq
keyword : poisson_eq
root repository : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1
number of processus : 1
Physics
poisson_eq
poisson_eq


modeling : GenericPDE
type : poisson_eq
name : poisson_eq
Parameters
Name | Expression | Symbol | Shape | Components
c | {1,0,0,1} | physics_poisson_eq_poisson_eq_c | tensor2 [2x2] | Symbol
Indices
physics_poisson_eq_poisson_eq_c_00 | 0,0
physics_poisson_eq_poisson_eq_c_01 | 0,1
physics_poisson_eq_poisson_eq_c_10 | 1,0
physics_poisson_eq_poisson_eq_c_11 | 1,1
f | 1 | physics_poisson_eq_poisson_eq_f | scalar
Meshes
Mesh : poisson_eq
Discretization : /Mesh/object-9
Import configuration
geo-filename :
hsize : 1.000000e-01
generate-partitioning : 0


Discretization
dim : 2
h_average : 5.095217e-02
h_max : 6.887751e-02
h_min : 4.286120e-02
n_elements : 952
n_faces : 1468
n_partition : 1
n_points : 517
order : 1
real_dim : 2
shape : Simplex_2_1_2
Boundary Conditions
Dirichlet
g
method : elimination
expr : 0
markers : Gamma_D
Function Spaces
Potential
mesh : /Mesh/object-9
nSpace : 1


Basis
is_continuous : 1
nComponents : 1
nComponents1 : 1
nComponents2 : 1
nLocalDof : 3
name : lagrange
order : 1
shape : scalar
Dof Table
nDof : 517
Fields
Potential
base symbol : u
function space : /FunctionSpace/object-8
name : Potential
prefix symbol : poisson_eq
Potential_previous
base symbol : u_previous
function space : /FunctionSpace/object-8
name : Potential_previous
prefix symbol : poisson_eq
Potential_remove_trial
base symbol : u_rt

```
| | | |  function space : /FunctionSpace/object-8  | |
| |
| | | |  name           : Potential_remove_trial   | |
| |
| | | |  prefix symbol  : poisson_eq               | |
| |
| | +-------------------------------------------+ |
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| | +-----------------------------------------------+
| |
| +-------------------------------------------------------------------------------------------------------------------
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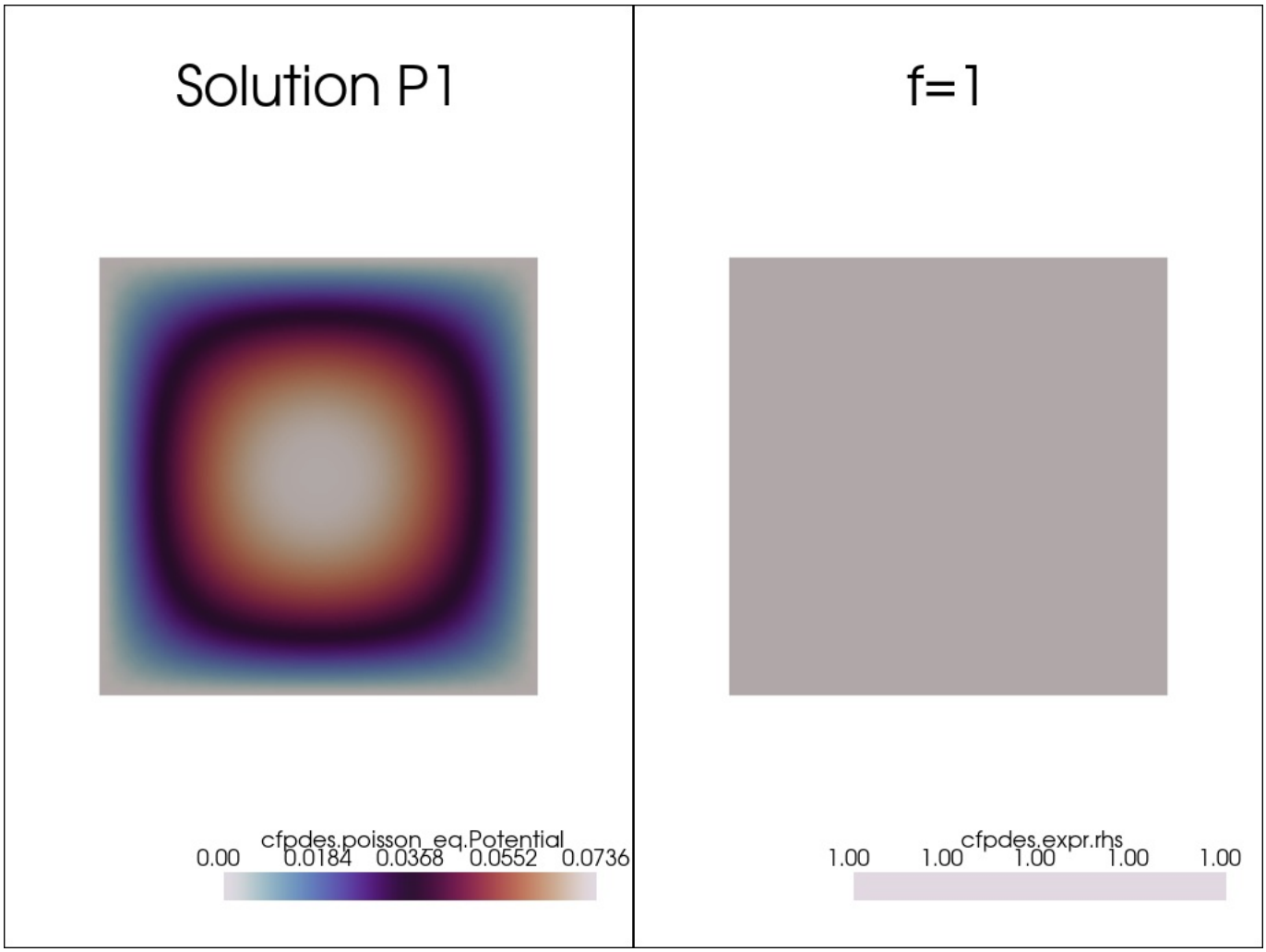
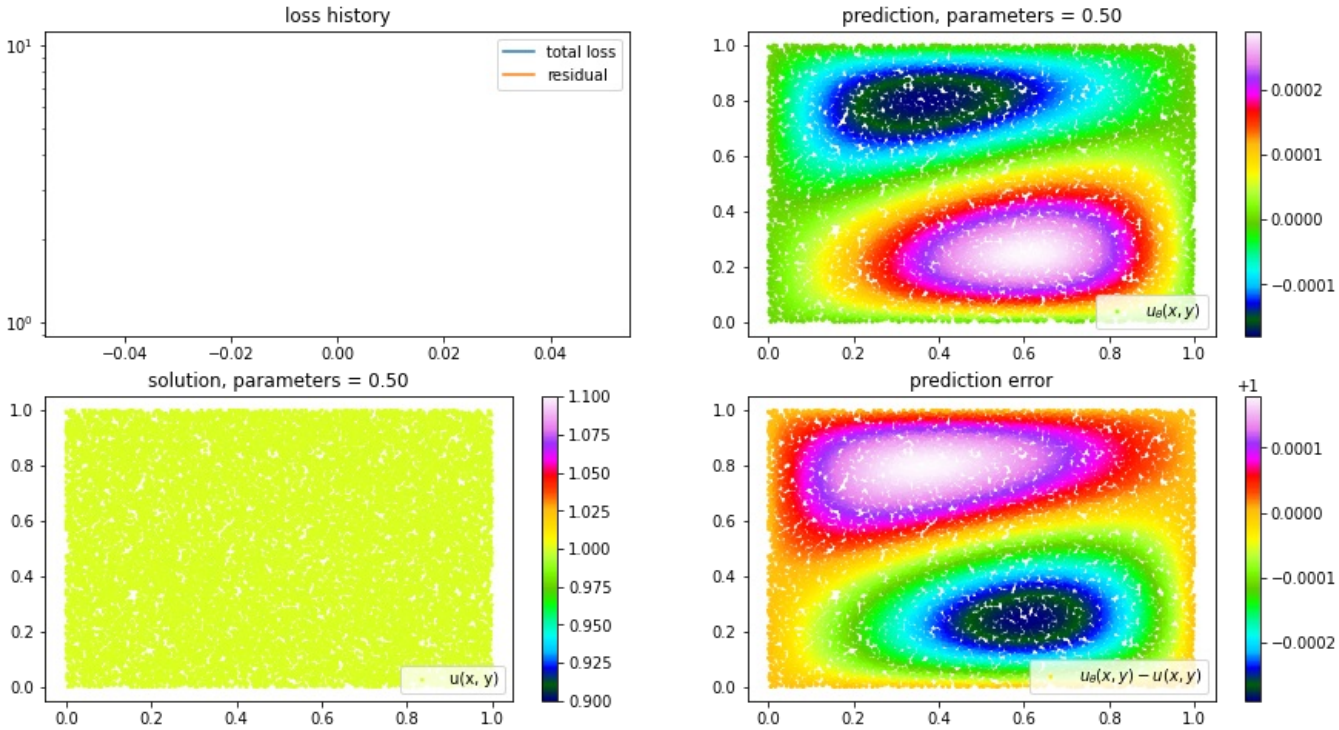
```




```
Solving using Scimba
>> load network /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/networks/test.pth
network was not loaded from file: training needed
```




```
Solving the laplacian problem for hsize = 0.1...
[loadMesh] Loading mesh in format geo+msh: "/workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2
.geo"
[loadMesh] Use default geo desc: /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2.geo 0.1
+----------------------------------------------------------------------------------------------------------------
-----------------------------------+
| Toolbox::cfpdes-2d-p1 - Use Case Study
|
+----------------------------------------------------------------------------------------------------------------
-----------------------------------+
| +-------------------------------------------------------------------------------------+
|
| | Environment                                                                         |
|
| +-------------------------------------------------------------------------------------+
|
| |  prefix              : cfpdes                                                       |
|
| |  keyword             : cfpdes-2d-p1                                                 |
|
| |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
|
| |  number of processus : 1                                                            |
|
| +-------------------------------------------------------------------------------------+
|
| +--------------------------+
|
```

```
| | Materials Properties      |
|
| +--------------------------+
|
| |  number of materials : 1  |
|
| +--------------------------+
|
| +---------------------------------------------+
|
| | Meshes                                      |
|
| +---------------------------------------------+
|
| | +-----------------------------------------+ |
|
| | | Mesh : cfpdes-2d-p1                     | |
|
| | +-----------------------------------------+ |
|
| | |  Discretization : /Mesh/object-11       | |
|
| | | +-------------------------------------+ | |
|
| | | | Import configuration                | | |
|
| | | +-------------------------------------+ | |
|
| | | |  geo-filename          :            | | |
|
| | | |  hsize                 : 1.000000e-01  | | |
|
| | | |  generate-partitioning : 0          | | |
|
| | | +-------------------------------------+ | |
|
| | | +-----------------------------+         | |
|
| | | | Discretization              |         | |
|
| | | +-----------------------------+         | |
|
| | | |  dim         : 2            |         | |
|
| | | |  h_average   : 1.018751e-01 |         | |
|
| | | |  h_max       : 1.168628e-01 |         | |
|
| | | |  h_min       : 8.366122e-02 |         | |
|
| | | |  n_elements  : 248          |         | |
|
| | | |  n_faces     : 392          |         | |
|
| | | |  n_partition : 1            |         | |
|
| | | |  n_points    : 145          |         | |
|
| | | |  order       : 1            |         | |
|
| | | |  real_dim    : 2            |         | |
|
| | | |  shape       : Simplex_2_1_2  |         | |
|
| | | +-----------------------------+         | |
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| | +-----------------------------------------+ |
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| +---------------------------------------------+
|
| +---------------------------------+
|
| | Algebraic Solver                |
|
| +---------------------------------+
|
| | +------------------+            |
|
| | | Backend          |            |
|
| | +------------------+            |
|
| | |  prefix : cfpdes  |            |
```

```
|
| | |  type   : petsc   |           |
|
| | +-------------------+           |
|
| | +----------------------------+  |
|
| | | KSP                        |  |
|
| | +----------------------------+  |
|
| | |  atol       : 1.000000e-50  |  |
|
| | |  dtol       : 1.000000e+05  |  |
|
| | |  maxit      : 1000          |  |
|
| | |  reuse-prec : 0             |  |
|
| | |  rtol       : 1.000000e-08  |  |
|
| | |  type       : gmres         |  |
|
| | +----------------------------+  |
|
| | +---------------------------+   |
|
| | | SNES                      |   |
|
| | +---------------------------+   |
|
| | |  atol      : 1.000000e-50  |   |
|
| | |  maxit     : 50            |   |
|
| | |  reuse-jac : 0             |   |
|
| | |  rtol      : 1.000000e-08  |   |
|
| | |  stol      : 1.000000e-08  |   |
|
| | +---------------------------+   |
|
| | +----------------------------+  |
|
| | | KSP in SNES                |  |
|
| | +----------------------------+  |
|
| | |  maxit      : 1000          |  |
|
| | |  reuse-prec : 0             |  |
|
| | |  rtol       : 1.000000e-05  |  |
|
| | +----------------------------+  |
|
| | +-----------------------------+ |
|
| | | PC                          | |
|
| | +-----------------------------+ |
|
| | |  mat-solver-package : mumps  | |
|
| | |  type               : lu     | |
|
| | +-----------------------------+ |
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| +---------------------------------+
|
| +-------------------------------------------------------------------------------------------------------------------
---------------------------------+ |
| | Toolbox Coefficient Form PDE : poisson_eq
| |
| +-------------------------------------------------------------------------------------------------------------------
---------------------------------+ |
| | +-------------------------------------------------------------------------------------+
| |
| | | Environment                                                                          |
| |
| | +-------------------------------------------------------------------------------------+
| |
```

```
| | |  prefix              : cfpdes.poisson_eq                                          |
| |
| | |  keyword             : poisson_eq                                                 |
| |
| | |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
| |
| | |  number of processus : 1                                                          |
| |
| | +-----------------------------------------------------------------------------------+
| |
| | +-------------------------------------------------------------------------------------------------------------
--------------------------------+ | |
| | | Physics
| | |
| | +-------------------------------------------------------------------------------------------------------------
--------------------------------+ | |
| | | +-----------------------------------------------------------------------------------------------------------
-----------------------------+ | | |
| | | | poisson_eq
| | | |
| | | +-----------------------------------------------------------------------------------------------------------
-----------------------------+ | | |
| | | | +-------------------------------------------------------------------------------------------------------
---------------------------+ | | | |
| | | | | poisson_eq
| | | | |
| | | | +-------------------------------------------------------------------------------------------------------
---------------------------+ | | | |
| | | | |  modeling : GenericPDE
| | | | |
| | | | |  type     : poisson_eq
| | | | |
| | | | |  name     : poisson_eq
| | | | |
| | | | | +-----------------------------------------------------------------------------------------------------
-------------------------+ | | | | |
| | | | | | Parameters
| | | | | |
| | | | | +-----------------------------------------------------------------------------------------------------
-------------------------+ | | | | |
| | | | | | +------+--------------+---------------------------------+--------------+-------------------------
-----------------------+ | | | | | |
| | | | | | | Name | Expression    | Symbol                          | Shape        | Components
| | | | | | |
| | | | | | | +======+==============+=================================+==============+=========================
=======================+ | | | | | |
| | | | | | | c    | {1.0,0,0,x*y} | physics_poisson_eq_poisson_eq_c | tensor2 [2x2] | +-----------------------
-----------+---------+ | | | | | | |
| | | | | | | |      |               |                                 |              | | Symbol
| Indices | | | | | | | |
| | | | | | | |      |               |                                 |              | +=======================
============+=========+ | | | | | | |
| | | | | | | |      |               |                                 |              | | physics_poisson_eq_pois
son_eq_c_00 | 0,0     | | | | | | | |
| | | | | | | |      |               |                                 |              | +-----------------------
-----------+---------+ | | | | | | |
| | | | | | | |      |               |                                 |              | | physics_poisson_eq_pois
son_eq_c_01 | 0,1     | | | | | | | |
| | | | | | | |      |               |                                 |              | +-----------------------
-----------+---------+ | | | | | | |
| | | | | | | |      |               |                                 |              | | physics_poisson_eq_pois
son_eq_c_10 | 1,0     | | | | | | | |
| | | | | | | |      |               |                                 |              | +-----------------------
-----------+---------+ | | | | | | |
| | | | | | | |      |               |                                 |              | | physics_poisson_eq_pois
son_eq_c_11 | 1,1     | | | | | | | |
| | | | | | | |      |               |                                 |              | +-----------------------
-----------+---------+ | | | | | | |
| | | | | | | +------+--------------+---------------------------------+--------------+-------------------------
-----------------------+ | | | | | |
| | | | | | | f    | 1             | physics_poisson_eq_poisson_eq_f | scalar       |
| | | | | | |
| | | | | | | +------+--------------+---------------------------------+--------------+-------------------------
-----------------------+ | | | | | |
| | | | | +-------------------------------------------------------------------------------------------------------
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| | | | +-------------------------------------------------------------------------------------------------------
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| | | +-----------------------------------------------------------------------------------------------------------
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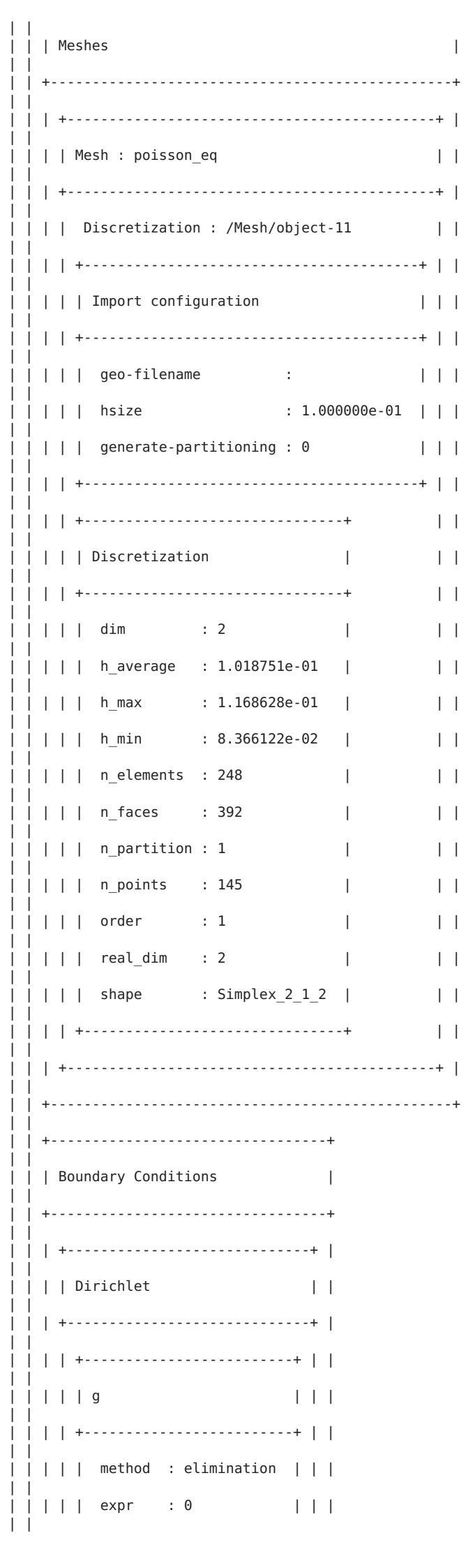
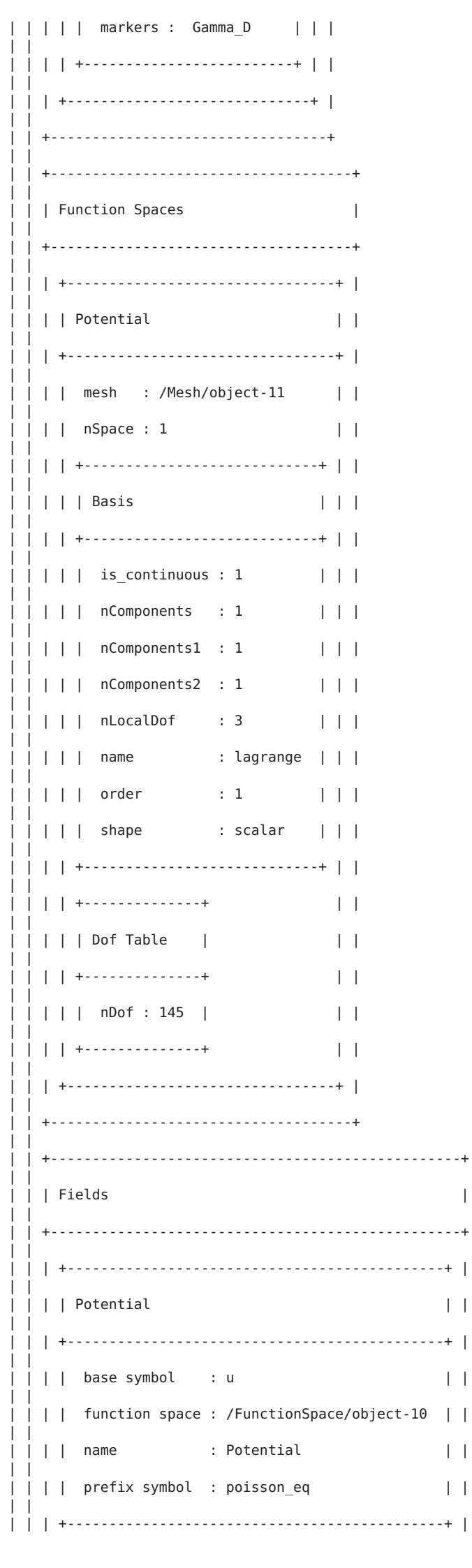
| | +-----------------------------------------------+
```


Meshes
Mesh : poisson_eq
Discretization : /Mesh/object-11
Import configuration
geo-filename :
hsize : 1.000000e-01
generate-partitioning : 0
Discretization
dim : 2
h_average : 1.018751e-01
h_max : 1.168628e-01
h_min : 8.366122e-02
n_elements : 248
n_faces : 392
n_partition : 1
n_points : 145
order : 1
real_dim : 2
shape : Simplex_2_1_2
Boundary Conditions
Dirichlet
g
method : elimination
expr : 0


markers : Gamma_D
Function Spaces
Potential
mesh : /Mesh/object-11
nSpace : 1
Basis
is_continuous : 1
nComponents : 1
nComponents1 : 1
nComponents2 : 1
nLocalDof : 3
name : lagrange
order : 1
shape : scalar
Dof Table
nDof : 145
Fields
Potential
base symbol : u
function space : /FunctionSpace/object-10
name : Potential
prefix symbol : poisson_eq

```
| |
| | +-----------------------------------------+ |
| |
| | | Potential_previous                        | |
| |
| | +-----------------------------------------+ |
| |
| | |  base symbol    : u_previous              | |
| |
| | |  function space : /FunctionSpace/object-10  | |
| |
| | |  name           : Potential_previous      | |
| |
| | |  prefix symbol  : poisson_eq              | |
| |
| | +-----------------------------------------+ |
| |
| | +-----------------------------------------+ |
| |
| | | Potential_remove_trial                    | |
| |
| | +-----------------------------------------+ |
| |
| | |  base symbol    : u_rt                    | |
| |
| | |  function space : /FunctionSpace/object-10  | |
| |
| | |  name           : Potential_remove_trial  | |
| |
| | |  prefix symbol  : poisson_eq              | |
| |
| | +-----------------------------------------+ |
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| +-------------------------------------------------+
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| +-------------------------------------------------------------------------------------------------------------------------------
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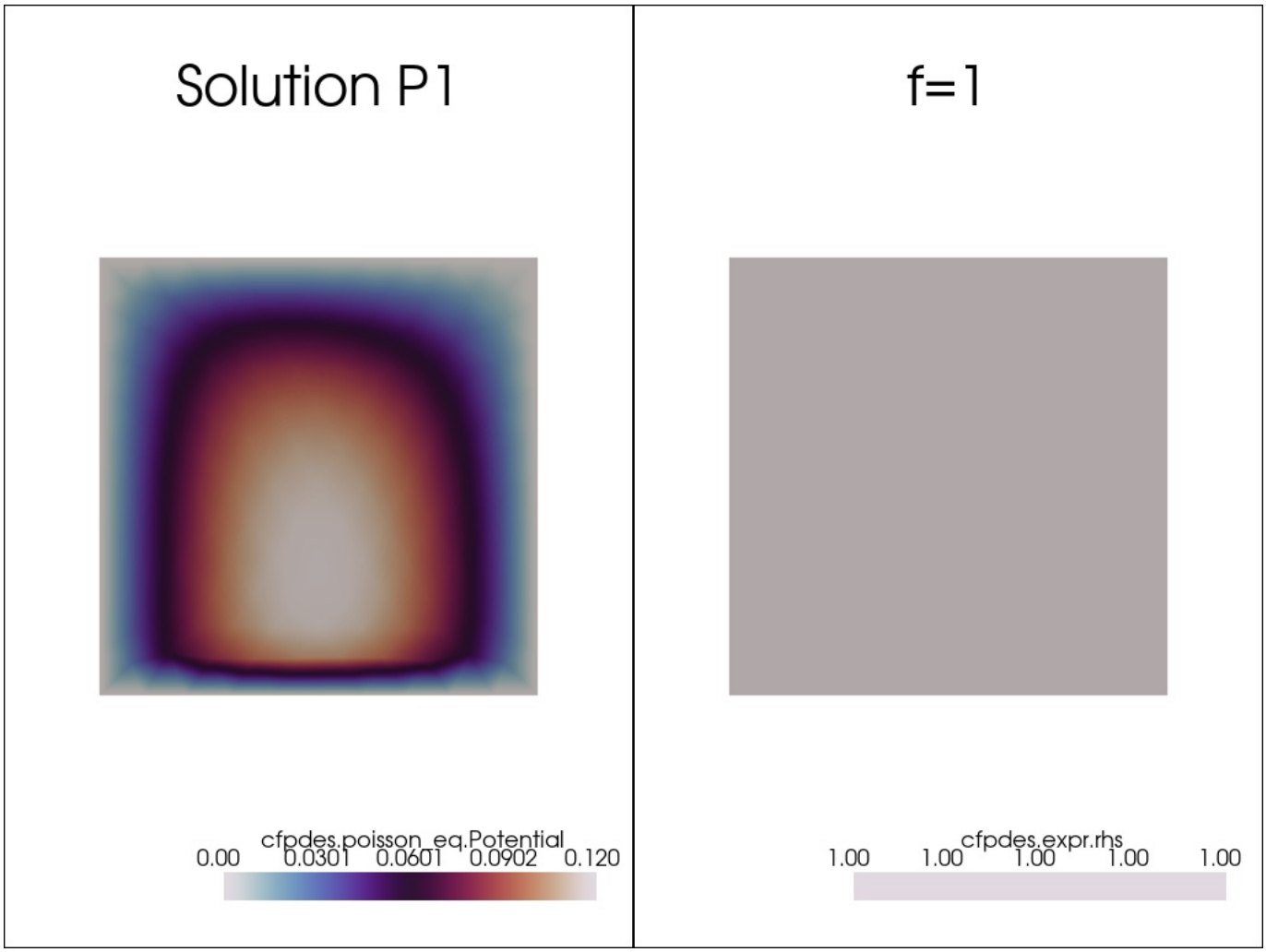
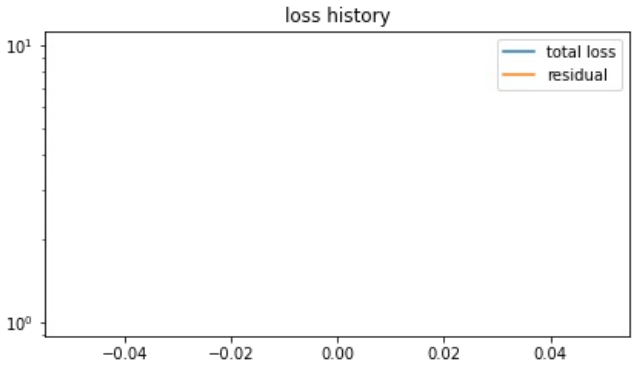
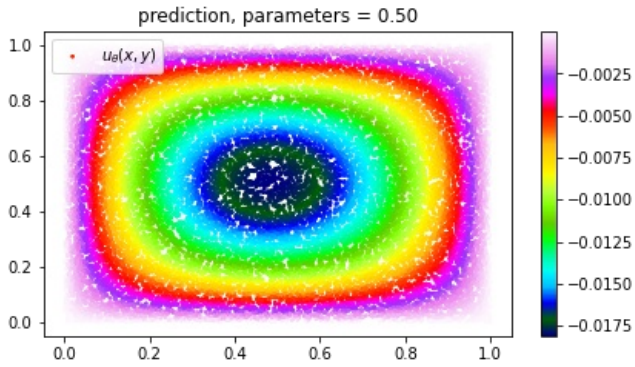
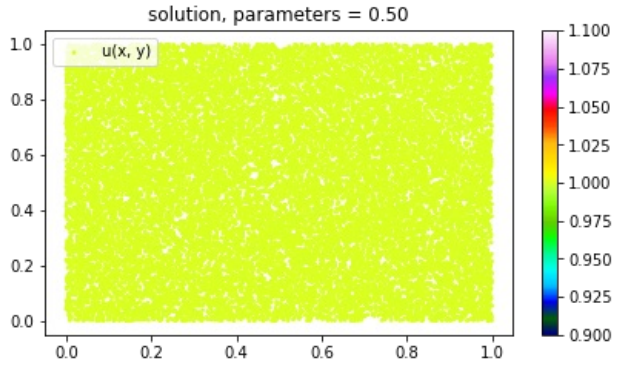
```

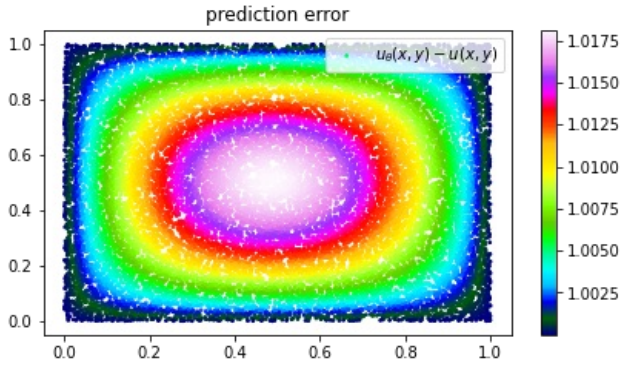



```
Solving using Scimba
>> load network /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/networks/test.pth
network was not loaded from file: training needed
```










```
Solving the laplacian problem for hsize = 0.1...
[loadMesh] Loading mesh in format geo+msh: "/workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2
.geo"
[loadMesh] Use default geo desc: /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/omega-2.geo 0.1
+----------------------------------------------------------------------------------------------------------------
----------------------------------+
| Toolbox::cfpdes-2d-p1 - Use Case Study
|
+----------------------------------------------------------------------------------------------------------------
----------------------------------+
| +-------------------------------------------------------------------------------------+
|
| | Environment                                                                       |
|
| +-------------------------------------------------------------------------------------+
|
| |  prefix              : cfpdes                                                     |
|
| |  keyword             : cfpdes-2d-p1                                               |
|
| |  root repository     : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1  |
|
| |  number of processus : 1                                                          |
|
| +-------------------------------------------------------------------------------------+
|
| +---------------------------+
|
| | Materials Properties      |
|
| +---------------------------+
|
| |  number of materials : 1  |
|
| +---------------------------+
|
| +-----------------------------------------------+
|
| | Meshes                                        |
|
| +-----------------------------------------------+
|
| | +-------------------------------------------+ |
|
| | | Mesh : cfpdes-2d-p1                       | |
|
| | +-------------------------------------------+ |
|
| | |  Discretization : /Mesh/object-13         | |
|
| | | +---------------------------------------+ | |
|
| | | | Import configuration                  | | |
```

```
|
| | +--------------------------------------+ | |
|
| | |  geo-filename          :              | | |
|
| | |  hsize                 : 1.000000e-01  | | |
|
| | |  generate-partitioning : 0             | | |
|
| | +--------------------------------------+ | |
|
| | +------------------------------+         | |
|
| | | Discretization               |         | |
|
| | +------------------------------+         | |
|
| | |  dim         : 2             |         | |
|
| | |  h_average   : 1.018751e-01  |         | |
|
| | |  h_max       : 1.168628e-01  |         | |
|
| | |  h_min       : 8.366122e-02  |         | |
|
| | |  n_elements  : 248           |         | |
|
| | |  n_faces     : 392           |         | |
|
| | |  n_partition : 1             |         | |
|
| | |  n_points    : 145           |         | |
|
| | |  order       : 1             |         | |
|
| | |  real_dim    : 2             |         | |
|
| | |  shape       : Simplex_2_1_2 |         | |
|
| | +------------------------------+         | |
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|
| Algebraic Solver                |
|
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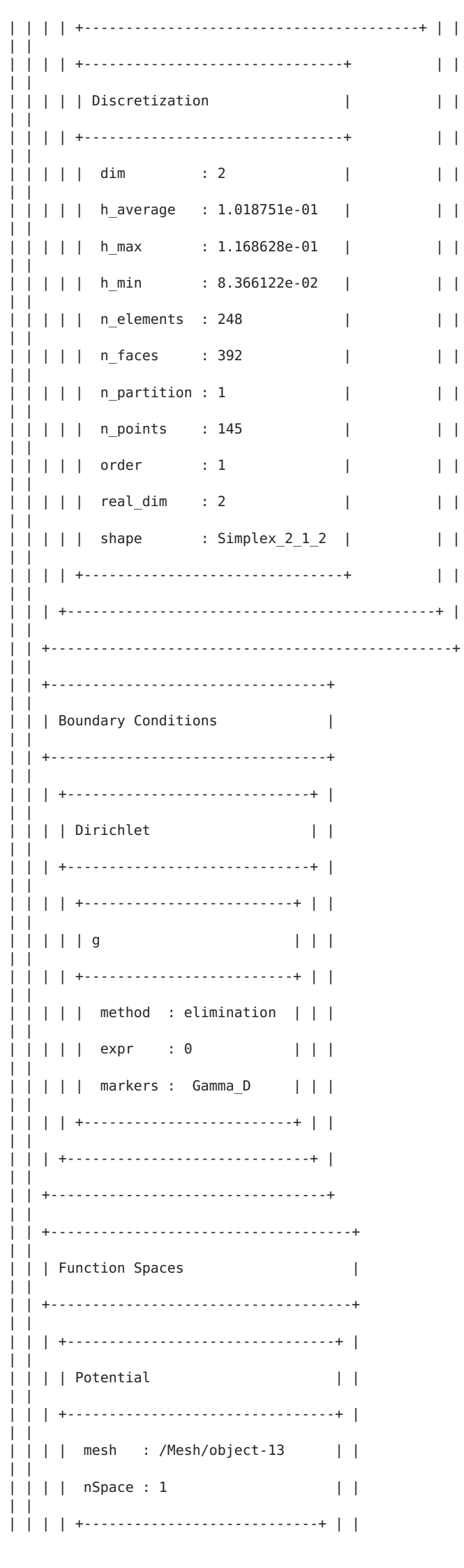
|
| +-------------------+           |
|
| | Backend           |           |
|
| +-------------------+           |
|
| |  prefix : cfpdes  |           |
|
| |  type   : petsc   |           |
|
| +-------------------+           |
|
| +---------------------------+   |
|
| | KSP                       |   |
|
| +---------------------------+   |
|
| |  atol       : 1.000000e-50  |   |
|
| |  dtol       : 1.000000e+05  |   |
|
| |  maxit      : 1000          |   |
|
| |  reuse-prec : 0             |   |
|
| |  rtol       : 1.000000e-08  |   |
|
| |  type       : gmres         |   |
|
| +---------------------------+   |
|
```


SNES
atol : 1.000000e-50
maxit : 50
reuse-jac : 0
rtol : 1.000000e-08
stol : 1.000000e-08
KSP in SNES
maxit : 1000
reuse-prec : 0
rtol : 1.000000e-05
PC
mat-solver-package : mumps
type : lu
Toolbox Coefficient Form PDE : poisson_eq
Environment
prefix : cfpdes.poisson_eq
keyword : poisson_eq
root repository : /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1
number of processus : 1
Physics
poisson_eq
poisson_eq


modeling : GenericPDE
type : poisson_eq
name : poisson_eq
Parameters
Name | Expression | Symbol | Shape | Components
c | {x,y,-y,y+x} | physics_poisson_eq_poisson_eq_c | tensor2 [2x2] |
Indices | | | | | | | Symbol
physics_poisson_eq_poisson_eq_c_00 | 0,0
physics_poisson_eq_poisson_eq_c_01 | 0,1
physics_poisson_eq_poisson_eq_c_10 | 1,0
physics_poisson_eq_poisson_eq_c_11 | 1,1
f | 1 | physics_poisson_eq_poisson_eq_f | scalar |
Meshes
Mesh : poisson_eq
Discretization : /Mesh/object-13
Import configuration
geo-filename :
hsize : 1.000000e-01
generate-partitioning : 0


Discretization
dim : 2
h_average : 1.018751e-01
h_max : 1.168628e-01
h_min : 8.366122e-02
n_elements : 248
n_faces : 392
n_partition : 1
n_points : 145
order : 1
real_dim : 2
shape : Simplex_2_1_2
Boundary Conditions
Dirichlet
g
method : elimination
expr : 0
markers : Gamma_D
Function Spaces
Potential
mesh : /Mesh/object-13
nSpace : 1


Basis
is_continuous : 1
nComponents : 1
nComponents1 : 1
nComponents2 : 1
nLocalDof : 3
name : lagrange
order : 1
shape : scalar
Dof Table
nDof : 145
Fields
Potential
base symbol : u
function space : /FunctionSpace/object-12
name : Potential
prefix symbol : poisson_eq
Potential_previous
base symbol : u_previous
function space : /FunctionSpace/object-12
name : Potential_previous
prefix symbol : poisson_eq
Potential_remove_trial
base symbol : u_rt

```
| | | |  function space : /FunctionSpace/object-12  | |
| |
| | | |  name           : Potential_remove_trial    | |
| |
| | | |  prefix symbol  : poisson_eq                | |
| |
| | +-------------------------------------------+ |
| |
| | +-----------------------------------------------+
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+-------------------------------------------------------------------------------------------------------------------
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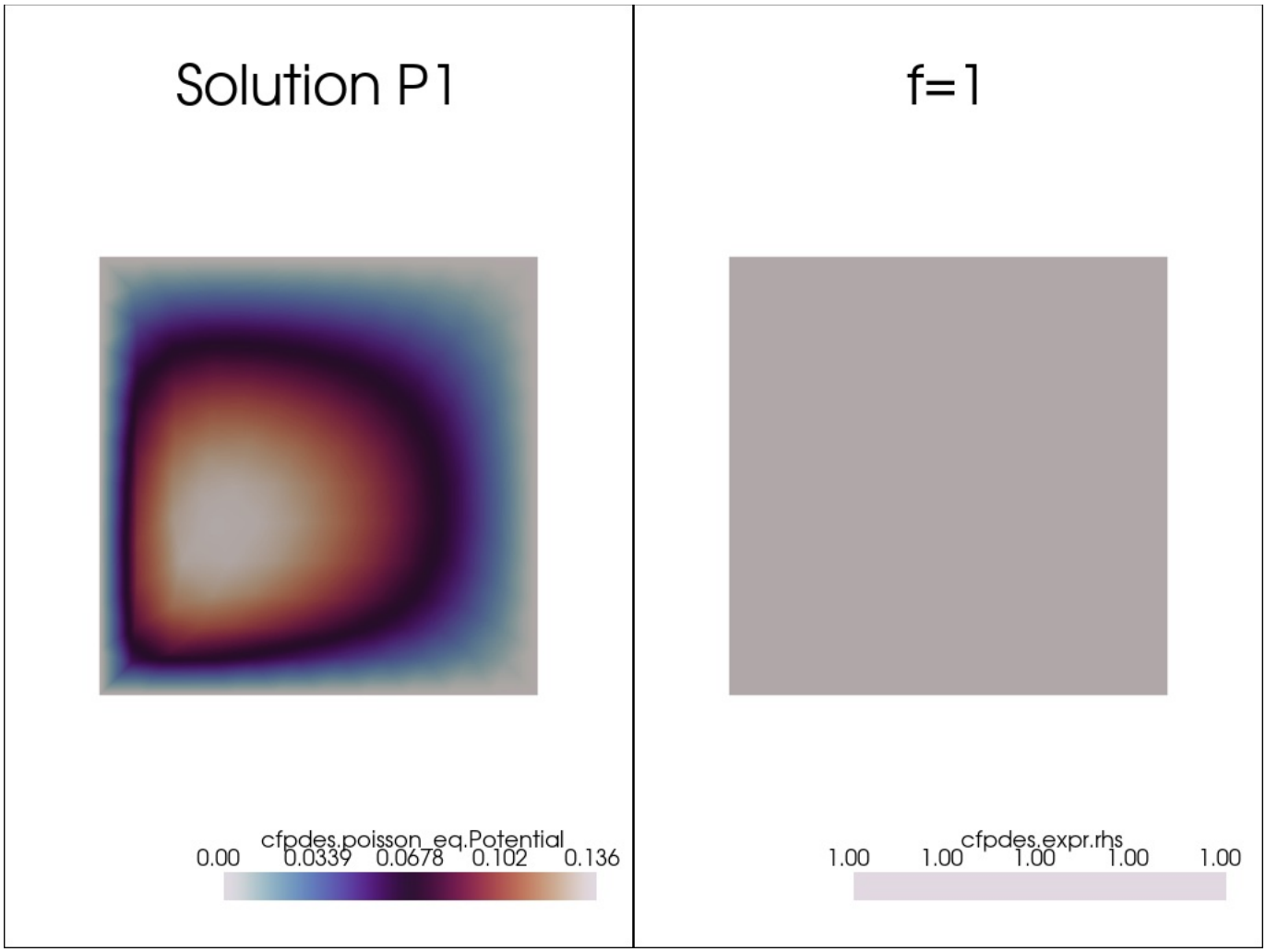
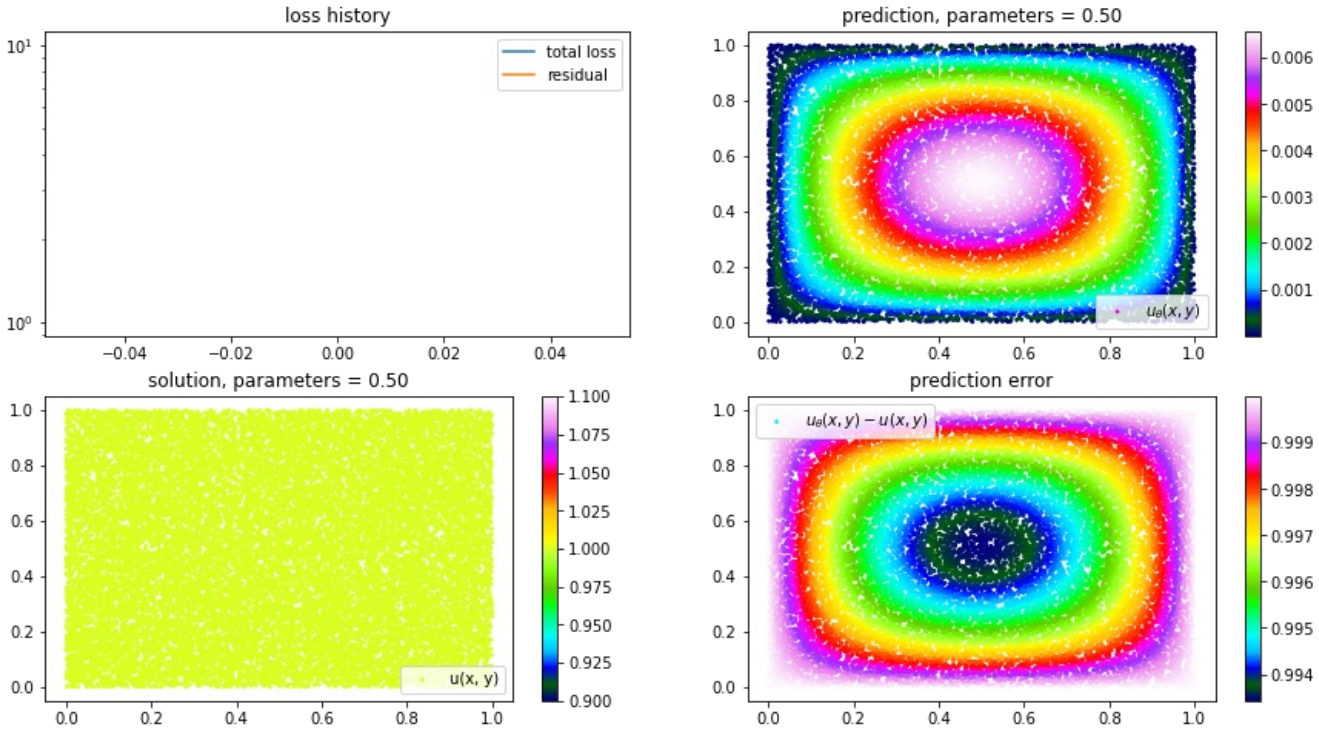
```




```
Solving using Scimba
>> load network /workspaces/2024-m1-scimba-feelpp/feelppdb/feelpp_cfpde/np_1/networks/test.pth
network was not loaded from file: training needed
```



Out[ ]: "\npour scimba\n# eval('__') rhs = x1 \nf = eval(rhs)\nrhs.replace('x','x1')\n\n"