

helmholtz.pde

```
add linear-form f
add coefficient-function, name = coef_dirichlet
add numproc npsv, type = SetValues
add numproc np1, type = Boundary Value Problem
add numproc npv1, type = Visualization
End of file reached
```

Solve PDE

```
[New Thread 0x7fffe020d700 (LWP 22889)]
Solve at level 0, NE = 35256, NP = 17981
[New Thread 0x7ffded20700 (LWP 22890)]
```

```
Thread 1 "netgen" received signal SIGSEGV, Segmentation fault.
0x00007fffe8c15cd7 in ngstd::IndirectArray<unsigned char,
ngstd::BaseArrayObject<ngstd::AOWrapper<netgen::Ng_Element::Ng_Edges> > >::operator[] (i=0,
  this=<optimized out>)
  at /home/dow/ngsuite/ngsolve-src/include/./ngstd/array.hpp:295
295     INLINE T operator[] (size_t i) const { return ba[ia[i]]; }
(gdb) where
```

```
#0 0x00007fffe8c15cd7 in ngstd::IndirectArray<unsigned char,
ngstd::BaseArrayObject<ngstd::AOWrapper<netgen::Ng_Element::Ng_Edges> > >::operator[] (i=0,
  this=<optimized out>)
  at /home/dow/ngsuite/ngsolve-src/include/./ngstd/array.hpp:295
```

```
class IndirectArray : public BaseArrayObject<IndirectArray<T, INDEX_ARRAY> >
{
    FlatArray<T> ba;
    const INDEX_ARRAY & ia;
public:
    INLINE IndirectArray (FlatArray<T> aba,
                          const INDEX_ARRAY & aia)
        : ba(aba), ia(aia) { ; }
    INLINE size_t Size() const { return ia.Size(); }
    INLINE T operator[] (size_t i) const { return ba[ia[i]]; }
    INLINE T & operator[] (size_t i) { return ba[ia[i]]; }
```

```
#1 ngfem::H1HighOrderFE<(ngfem::ELEMENT_TYPE)10,
ngfem::H1HighOrderFE_Shape<(ngfem::ELEMENT_TYPE)10>,
ngfem::T_ScalarFiniteElement<ngfem::H1HighOrderFE_Shape<(ngfem::ELEMENT_TYPE)10>,
(ngfem::ELEMENT_TYPE)10, ngfem::ScalarFiniteElement<2> >
>::SetOrderEdge<ngstd::IndirectArray<unsigned char,
```

```
ngstd::BaseArrayObject<ngstd::AOWrapper<netgen::Ng_Element::Ng_Edges> > > > (oe=...,  
this=0x7fffffc27a0)  
at /home/dow/ngsuite/ngsolve-src/include/./fem/h1hofe.hpp:95
```

```
/// set edge orders  
template <typename TA>  
void SetOrderEdge (const TA & oe)  
{ for (int i = 0; i < N_EDGE; i++) order_edge[i] = oe[i]; }
```

```
#2 ngcomp::H1HighOrderFESpace::T_GetFE<(ngfem::ELEMENT_TYPE)10> (  
this=this@entry=0x19b23c0, elnr=0, lh=...)  
at /home/dow/ngsuite/ngsolve-src/comp/h1hofespace.cpp:823  
template <ELEMENT_TYPE ET>
```

```
FiniteElement & H1HighOrderFESpace :: T_GetFE (int elnr, Allocator & lh) const  
{  
  Ngs_Element ngel = ma->GetElement<ET_trait<ET>::DIM,VOL> (elnr);  
  
  H1HighOrderFE<ET> * hofe = new (lh) H1HighOrderFE<ET> ();  
  
  hofe -> SetVertexNumbers (ngel.Vertices());  
  
  switch (int(ET_trait<ET>::DIM))  
  {  
  case 1:  
  {  
    hofe -> SetOrderEdge (0, order_inner[elnr][0]);  
    break;  
  }  
  
  case 2:  
  {  
    if(nodalp2)  
      hofe -> SetNodalp2();  
    hofe -> SetOrderEdge (order_edge[ngel.Edges()]);  
  }  
  }  
}
```

```
#3 0x00007fffe8c0651b in ngcomp::H1HighOrderFESpace::GetFE (this=0x19b23c0,  
ei=..., alloc=...)  
at /home/dow/ngsuite/ngsolve-src/comp/h1hofespace.cpp:755
```

```
FiniteElement & H1HighOrderFESpace :: GetFE (ElementId ei, Allocator & alloc) const  
{  
  Ngs_Element ngel = ma->GetElement(ei);  
  ELEMENT_TYPE eltype = ngel.GetType();
```

...

```
int elnr = ei.Nr();  
if (ei.IsVolume())
```

```

{
  switch (eltype)
  {
    case ET_SEGM: return T_GetFE<ET_SEGM> (elnr, alloc);

```

```

case ET_TRIG: return T_GetFE<ET_TRIG> (elnr, alloc);

```

```

#4 0x00007ffe8bc4c54 in ngcomp::GridFunctionCoefficientFunction::Evaluate (
  this=<optimized out>, ip=..., result=...)
  at /home/dow/ngsuite/ngsolve-src/comp/gridfunction.cpp:1405

```

```

void GridFunctionCoefficientFunction ::
Evaluate (const BaseMappedIntegrationPoint & ip, FlatVector<Complex> result) const
{
  LocalHeapMem<100000> lh2 ("GridFunctionCoefficientFunction, Eval complex");
  static Timer timer ("GFCoeffFunc::Eval-scal", 3);
  RegionTimer reg (timer);

```

```

  const int elnr = ip.GetTransformation().GetElementNr();
  VorB vb = ip.GetTransformation().VB();
  ElementId ei(vb, elnr);

```

...

```

const FiniteElement & fel = fes->GetFE (ei, lh2);

```

```

#5 0x00007ffe8bbe866 in ngcomp::VisualizeCoefficientFunction::GetSurfValue (
  this=0x1511100, elnr=<optimized out>, facetnr=<optimized out>,
  lam1=<optimized out>, lam2=<optimized out>, values=0x7ffffff3608)
  at /home/dow/ngsuite/ngsolve-src/comp/gridfunction.cpp:2833

```

```

bool VisualizeCoefficientFunction ::
GetSurfValue (int elnr, int facetnr,
  double lam1, double lam2,
  double * values)
{
  try
  {
  // cout << "viscoef, getsurfval1" << endl;
  LocalHeapMem<100000> lh("viscf::GetSurfValue");
  IntegrationPoint ip(lam1, lam2);
  ip.FacetNr() = facetnr;
  VorB vb = ma->GetDimension() == 3 ? BND : VOL;
  ElementId ei(vb, elnr);
  if (!cf->DefinedOn(ei)) return false;
  ElementTransformation & trafo = ma->GetTrafo (ei, lh);
  BaseMappedIntegrationPoint & mip = trafo(ip, lh);

  if (!cf -> IsComplex())
    cf -> Evaluate (mip, FlatVector<>(GetComponents(), values));

```

else

**cf -> Evaluate (mip, FlatVector<Complex>(GetComponents(), values));**

#6 0x00007ffff515b7e8 in netgen::VisualSceneSolution::GetSurfValue (  
this=this@entry=0x7ffff5376820 <netgen::vssolution>, data=0x1510fe0,  
selnr=selnr@entry=..., facetnr=facetnr@entry=-1, lam1=0.3333333,  
lam2=0.3333333, comp=<optimized out>,  
val=@0x7fffff3780: -nan(0xf000000000004))  
at /home/dow/ngsuite/ngsolve-  
src/external\_dependencies/netgen/libsrc/visualization/vssolution.cpp:3393

#7 0x00007ffff5167bdb in netgen::VisualSceneSolution::GetMinMax (  
this=this@entry=0x7ffff5376820 <netgen::vssolution>,  
funcnr=<optimized out>, comp=1,  
minv=@0x7ffff5376948: 1.7976931348623157e+308,  
maxv=@0x7ffff5376950: -1.7976931348623157e+308)  
at /home/dow/ngsuite/ngsolve-  
src/external\_dependencies/netgen/libsrc/visualization/vssolution.cpp:2703

#8 0x00007ffff516a822 in netgen::VisualSceneSolution::BuildScene (  
this=0x7ffff5376820 <netgen::vssolution>, zoomall=0)  
at /home/dow/ngsuite/ngsolve-  
src/external\_dependencies/netgen/libsrc/visualization/vssolution.cpp:776

#9 0x00007ffff51681b1 in netgen::VisualSceneSolution::DrawScene (  
this=0x7ffff5376820 <netgen::vssolution>)  
at /home/dow/ngsuite/ngsolve-  
src/external\_dependencies/netgen/libsrc/visualization/vssolution.cpp:373

#10 0x00007ffff7bb0e86 in netgen::draw (clientData=<optimized out>,  
---Type <return> to continue, or q <return> to quit---  
interp=<optimized out>, objc=<optimized out>, objv=<optimized out>)  
at /home/dow/ngsuite/ngsolve-src/external\_dependencies/netgen/ng/ngpkg.cpp:1953

#11 0x00007ffff6d4bfa7 in TclNRRunCallbacks ()  
from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so

#12 0x00007ffff7bc1682 in Togl\_CallCallback (togl=togl@entry=0xa38d40,  
cmd=<optimized out>)  
at /home/dow/ngsuite/ngsolve-src/external\_dependencies/netgen/ng/Togl2.1/togl.c:1253

#13 0x00007ffff7bc1aa2 in Togl\_Render (clientData=clientData@entry=0xa38d40)  
at /home/dow/ngsuite/ngsolve-src/external\_dependencies/netgen/ng/Togl2.1/togl.c:1695

#14 0x00007ffff7bc3fee in Togl\_ObjWidget (clientData=0xa38d40,  
interp=0x678300, objc=2, objv=0x6866b0)  
at /home/dow/ngsuite/ngsolve-src/external\_dependencies/netgen/ng/Togl2.1/togl.c:2135

#15 0x00007ffff6d4bfa7 in TclNRRunCallbacks ()  
from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so

#16 0x00007ffff7132ae1 in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#17 0x00007ffff7131ea2 in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#18 0x00007ffff6d4bfa7 in TclNRRunCallbacks ()  
    from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#19 0x00007ffff6d4cd15 in ?? () from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
---Type <return> to continue, or q <return> to quit---  
#20 0x00007ffff6d4c5f3 in Tcl\_EvalEx ()  
    from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#21 0x00007ffff6e35e46 in ?? () from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#22 0x00007ffff6e36651 in TclCallVarTraces ()  
    from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#23 0x00007ffff6e3e1d8 in ?? () from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#24 0x00007ffff6ddc2a3 in ?? () from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#25 0x00007ffff6d4bfa7 in TclNRRunCallbacks ()  
    from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#26 0x00007ffff7132ae1 in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#27 0x00007ffff7131ea2 in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#28 0x00007ffff6d4bfa7 in TclNRRunCallbacks ()  
    from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#29 0x00007ffff71a8ecd in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#30 0x00007ffff71af6ec in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#31 0x00007ffff6d4bfa7 in TclNRRunCallbacks ()  
    from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#32 0x00007ffff71b03c2 in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#33 0x00007ffff71a8ecd in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#34 0x00007ffff71af6ec in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#35 0x00007ffff6d4bfa7 in TclNRRunCallbacks ()  
    from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#36 0x00007ffff71b03c2 in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
---Type <return> to continue, or q <return> to quit---  
#37 0x00007ffff71a8ecd in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#38 0x00007ffff71af6ec in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#39 0x00007ffff6d4bfa7 in TclNRRunCallbacks ()  
    from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#40 0x00007ffff6d4cd15 in ?? () from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#41 0x00007ffff6d4c5f3 in Tcl\_EvalEx ()  
    from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#42 0x00007ffff70f5105 in Tk\_BindEvent ()  
    from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#43 0x00007ffff70fba55 in TkBindEventProc ()  
    from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#44 0x00007ffff7103eab in Tk\_HandleEvent ()  
    from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#45 0x00007ffff7104494 in ?? () from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#46 0x00007ffff6e12f3f in Tcl\_ServiceEvent ()  
    from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#47 0x00007ffff6e13175 in Tcl\_DoOneEvent ()  
    from /usr/lib/x86\_64-linux-gnu/libtcl8.6.so  
#48 0x00007ffff7104912 in Tk\_MainLoop ()

from /usr/lib/x86\_64-linux-gnu/libtk8.6.so  
#49 0x00000000040264f in main (argc=<optimized out>, argv=<optimized out>)  
at /home/dow/ngsuite/ngsolve-src/external\_dependencies/netgen/ng/ngappinit.cpp:285