geometryFromEdges

Create 2-D geometry from decomposed geometry matrix

Syntax

```
geometryFromEdges(model,g)
pg = geometryFromEdges(model,g)
```

Description

`geometryFromEdges(model,g)` adds the 2-D geometry described in `g` to the `model` container. example

`pg = geometryFromEdges(model,g)` additionally returns the geometry to the Workspace.

Examples

collapse all

Geometry from Decomposed Solid Geometry

Create a decomposed solid geometry model and include it in a PDE model.

Open Live Script

Create a default scalar PDE model.

```
model = createpde;
```

Define a circle in a rectangle, place these in one matrix, and create a set formula that subtracts the circle from the rectangle.

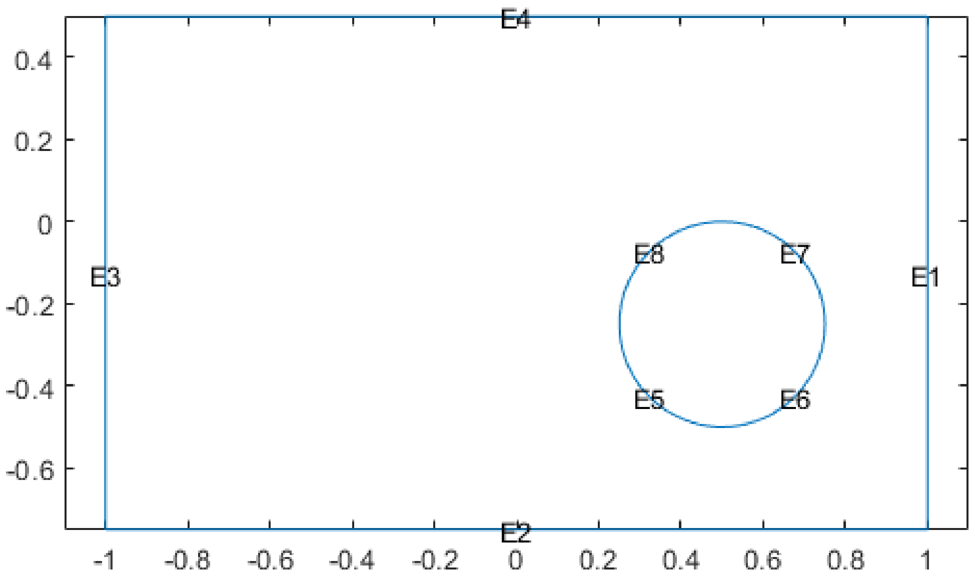
```
R1 = [3,4,-1,1,1,-1,0.5,0.5,-0.75,-0.75]';
C1 = [1,0.5,-0.25,0.25]';
C1 = [C1;zeros(length(R1) - length(C1),1)];
gm = [R1,C1];
sf = 'R1-C1';
```

Create the geometry.

```
ns = char('R1','C1');
ns = ns';
g = decsg(gm,sf,ns);
```

Include the geometry in the model and plot it.

```
geometryFromEdges(model,g);
pdegplot(model,'EdgeLabels','on')
axis equal
xlim([-1.1,1.1])
```

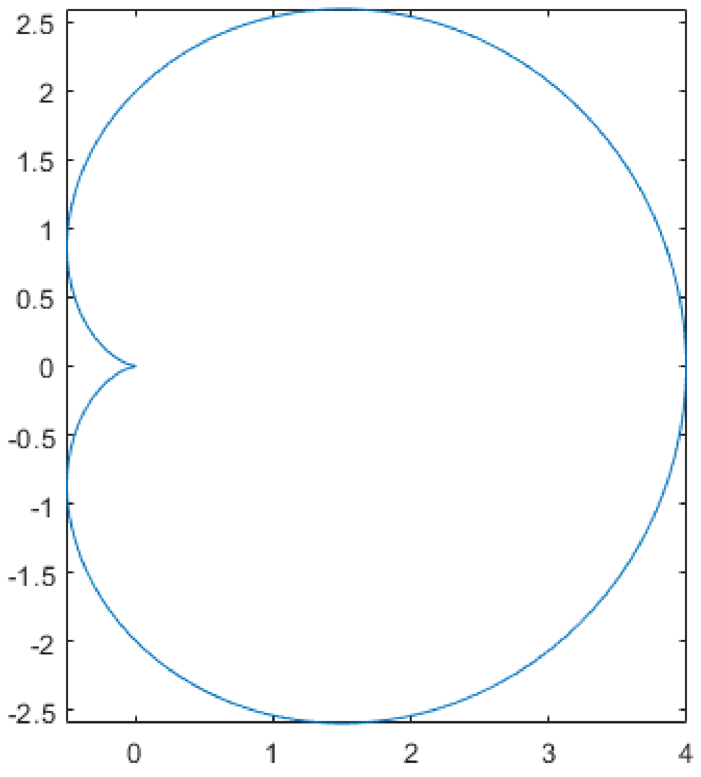


Predefined Geometry Functions

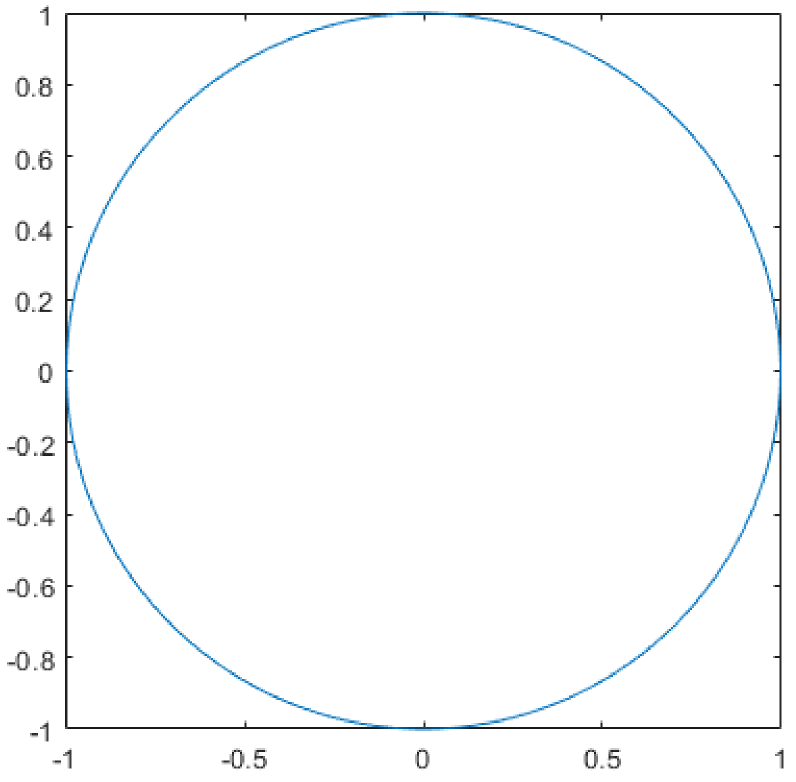
The toolbox provides the several geometry functions. Specify them by using the following function handles.

Open Live Script

```
model = createpde;
g = geometryFromEdges(model,@cardg);
pdegplot(model)
```

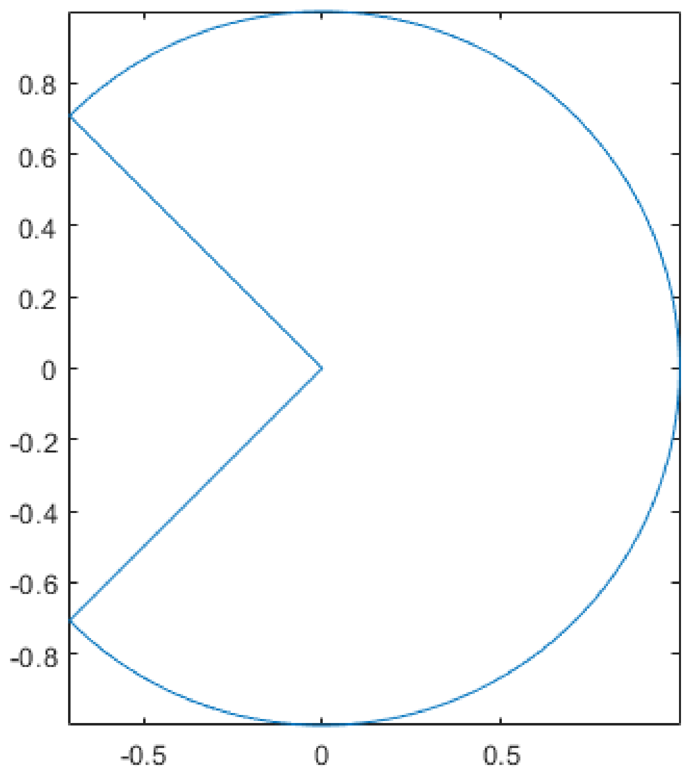


```
clear model
model = createpde;
g = geometryFromEdges(model,@circleg);
pdegplot(model)
```

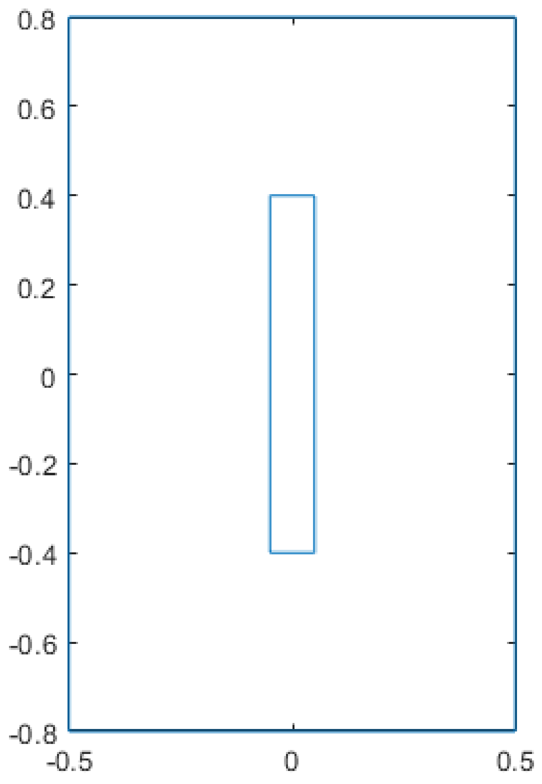


```
clear model
model = createpde;
```

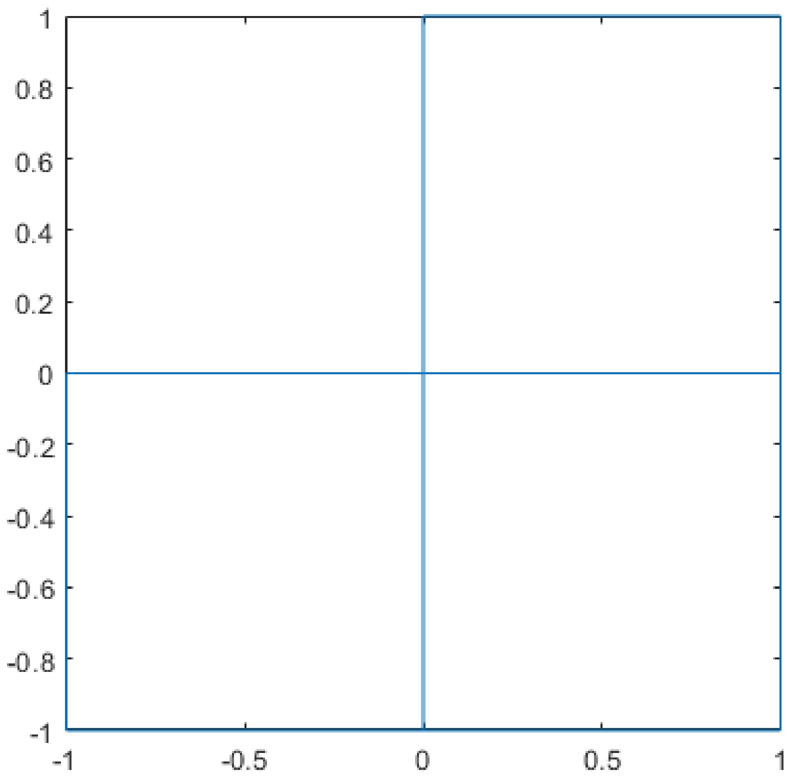
```
g = geometryFromEdges(model,@cirsg);
pdegplot(model)
```



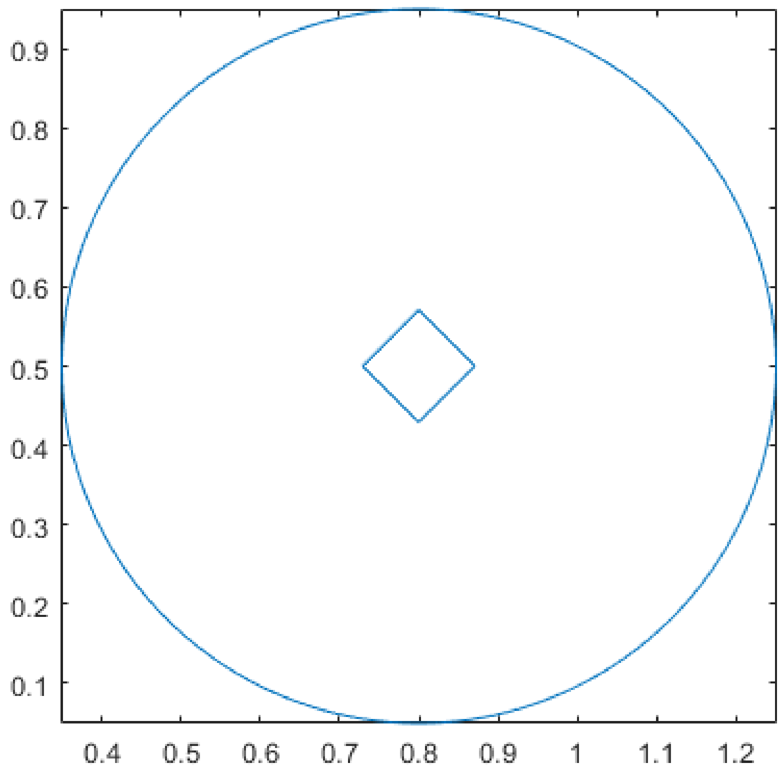
```
clear model
model = createpde;
g = geometryFromEdges(model,@crackg);
pdegplot(model)
```



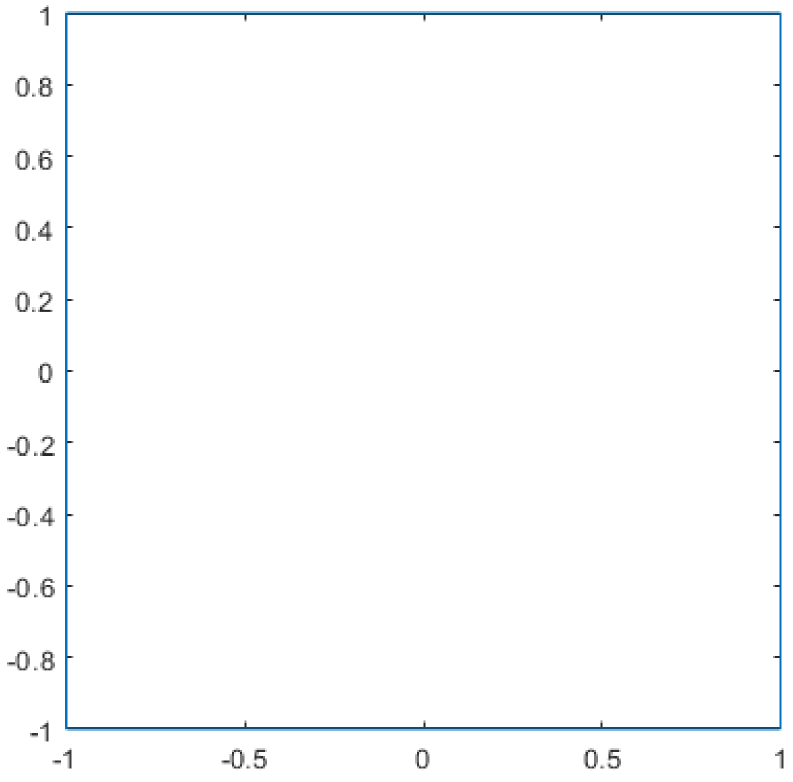
```
clear model
model = createpde;
g = geometryFromEdges(model,@lshapeg);
pdegplot(model)
```



```
clear model
model = createpde;
g = geometryFromEdges(model,@scatterg);
pdegplot(model)
```



```
clear model
model = createpde;
g = geometryFromEdges(model,@squareg);
pdegplot(model)
```



Input Arguments

collapse all

`model` — Model object

`PDEModel` object | `ThermalModel` object | `StructuralModel` object | `ElectromagneticModel` object

Model object, specified as a `PDEModel` object, `ThermalModel` object, `StructuralModel` object, or `ElectromagneticModel` object.

Example: `model = createpde(3)`

Example: `thermalmodel = createpde('thermal','steadystate')`

Example: `structuralmodel = createpde('structural','static-solid')`

Example: `emagmodel = createpde('electromagnetic','electrostatic')`

`g` — Geometry description

decomposed geometry matrix | name of a geometry function | handle to a geometry function

Geometry description, specified as a decomposed geometry matrix, as the name of a geometry function, or as a handle to a geometry function. For details about a decomposed geometry matrix, see `decsg`.

A geometry function must return the same result for the same input arguments in every function call. Thus, it must not contain functions and expressions designed to return a variety of results, such as random number generators.

Example: `geometryFromEdges(model,@circleg)`

Data Types: `double` | `char` | `function_handle`

Output Arguments

collapse all

`pg` — Geometry object

`AnalyticGeometry` object

Geometry object, returned as an AnalyticGeometry Properties object. This object is stored in `model.Geometry`.

See Also

AnalyticGeometry Properties | `PDEModel`

Topics

Solve PDEs with Constant Boundary Conditions

Solve Problems Using PDEModel Objects

Introduced in R2015a