In[1]:=
```
(* Two spheres of opposite index start to overlap,
and the plotting goes rogue.  Starts self-dual, then loses that symmetry. *)
```

In[2]:=
```
Clear[r]
```

In[3]:=
```
n = 4;
```

In[4]:=
```
X = {{0, 1, 0, 0}, {1, 0, 0, 0}, {0, 0, r, 1}, {0, 0, 1, r}};
```

In[5]:=
```
MatrixForm[X]
```

Out[5]//MatrixForm=

$$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & r & 1 \\ 0 & 0 & 1 & r \end{pmatrix}$$

In[6]:=
```
Y = {{0, -i, 0, 0}, {i, 0, 0, 0}, {0, 0, 0, i}, {0, 0, -i, 0}};
```

In[7]:=
```
MatrixForm[Y]
```

Out[7]//MatrixForm=

$$\begin{pmatrix} 0 & -i & 0 & 0 \\ i & 0 & 0 & 0 \\ 0 & 0 & 0 & i \\ 0 & 0 & -i & 0 \end{pmatrix}$$

In[8]:=
```
Z = {{1, 0, 0, 0}, {0, -1, 0, 0}, {0, 0, 1, 0}, {0, 0, 0, -1}};
```

In[9]:=
```
MatrixForm[Z]
```

Out[9]//MatrixForm=

$$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$$

In[10]:=
```
sigma1 = {{0, 1}, {1, 0}};
```

In[11]:=
```
sigma2 = {{0, -I}, {I, 0}};
```

In[12]:=
```
sigma3 = {{1, 0}, {0, -1}};
```

In[13]:=
```
loclzr = KroneckerProduct[sigma1, X - x * IdentityMatrix[n]] +
   KroneckerProduct[sigma2, Y - y * IdentityMatrix[n]] +
   KroneckerProduct[sigma3, Z - z * IdentityMatrix[n]] ;
```

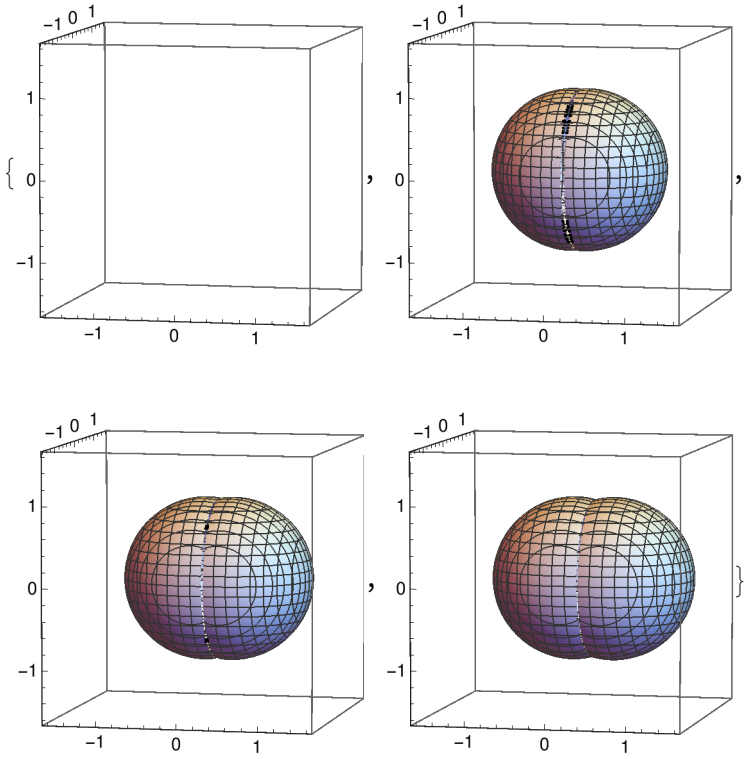
In[14]:=
```
charpoly = Det[loclzr];
```

In[15]:=
```
step = 1 / 6;
```

In[16]:=
```
plots = ParallelTable[ContourPlot3D[charpoly == 0, {x, -1.6, 1.6},
    {y, -1.6, 1.6}, {z, -1.6, 1.6}, Contours → {{1, LightBlue}},
    PlotPoints → 100, ViewPoint → {4, -18, 2}], {r, 0, 3/6, step}]
```

(kernel 6) Visualization`Core`ContourPlot3D::incmem : -- Message text not found -- (402653184)

Out[16]=



In[17]:=
```
Export["ClassAIIsphere0_6.eps", plots[[1]], ImageSize → 2.5 * 72];
```

In[18]:=
```
Export["ClassAIIsphere1_6.eps", plots[[2]], ImageSize → 2.5 * 72];
```

In[19]:=
```
Export["ClassAIIsphere2_6.eps", plots[[3]], ImageSize → 2.5 * 72];
```

In[20]:=
```
Export["ClassAIIsphere3_6.eps", plots[[4]], ImageSize → 2.5 * 72];
```