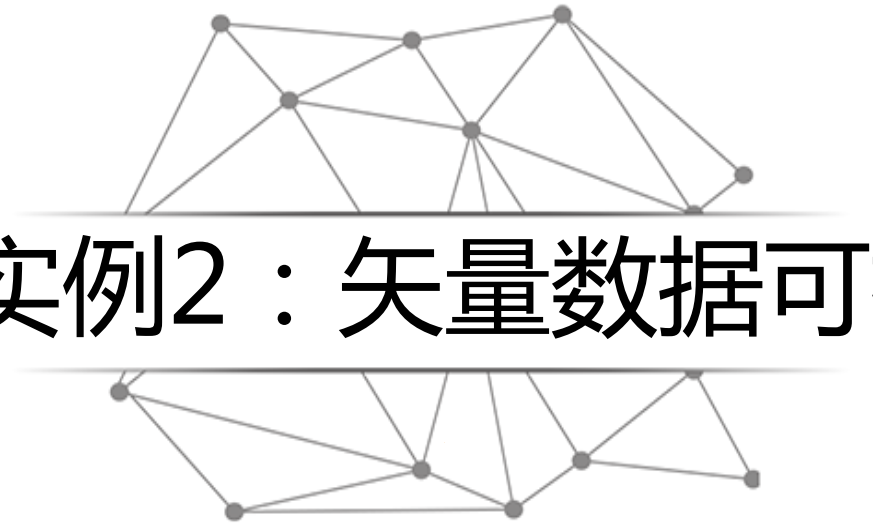


实例2：矢量数据可视化

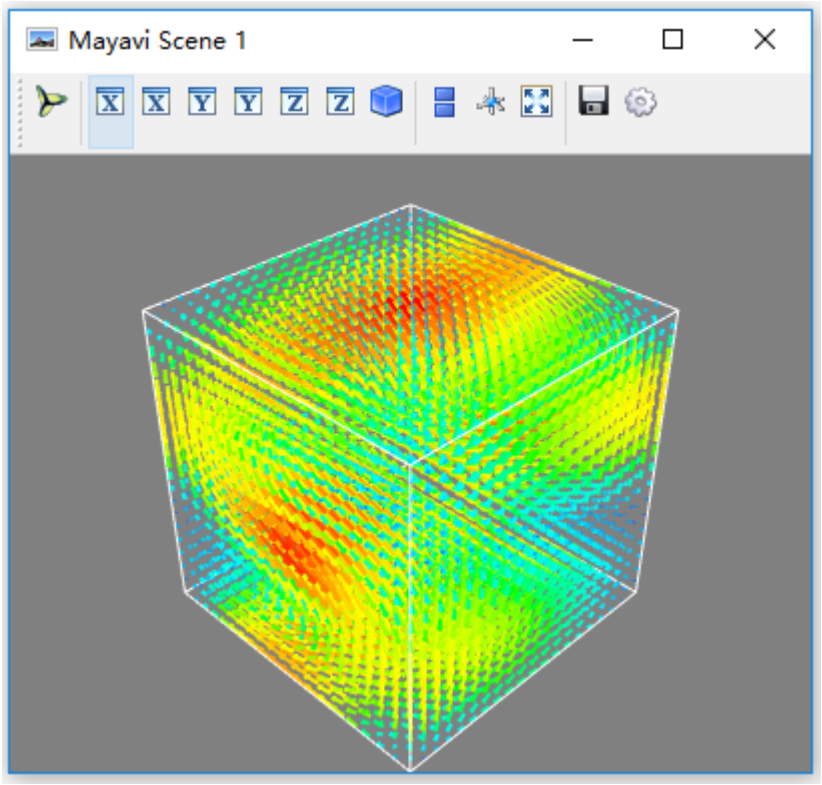
生成矢量数据

```
import numpy as np
x, y, z = np.mgrid[0:1:20j, 0:1:20j, 0:1:20j]

u =    np.sin(np.pi*x) * np.cos(np.pi*z)
v = -2*np.sin(np.pi*y) * np.cos(2*np.pi*z)
w = np.cos(np.pi*x)*np.sin(np.pi*z) + np.cos(np.pi*y)*np.sin(2*np.pi*z)
```

Quiver绘制

```
from mayavi import mlab
mlab.quiver3d(u,v,w)
mlab.outline()

mlab.show()
```

Quiver绘制



Masking Vector采样

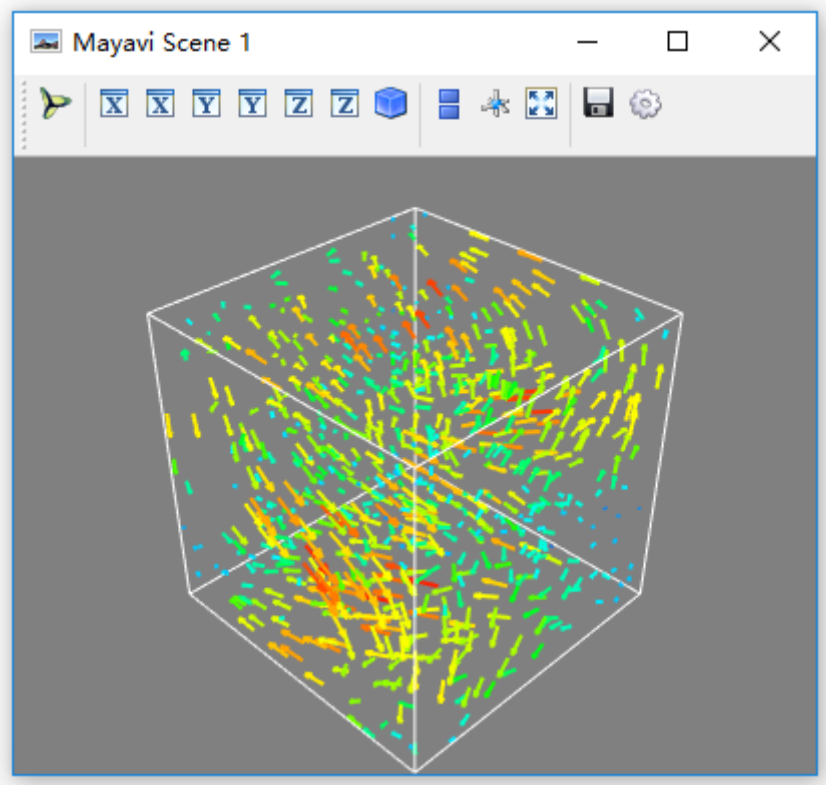
```
from mayavi import mlab
src = mlab.pipeline.vector_field(u, v, w)
mlab.pipeline.vectors(src, mask_points=10, scale_factor=2.0)

mlab.show()
```

Masking Vector采样

可尝试：

```
from mayavi import mlab
vectors = mlab.quiver3d(u,v,w)
vectors.glyph.mask_input_points = True
vectors.glyph.mask_points.on_ratio =10
vectors.glyph.glyph.scale_factor = 2.0

#src = mlab.pipeline.vector_field(u, v, w)
#mlab.pipeline.vectors(src, mask_points=10, scale_factor=2.0)
#mlab.quiver3d(u,v,w)
mlab.outline()
mlab.show()
```

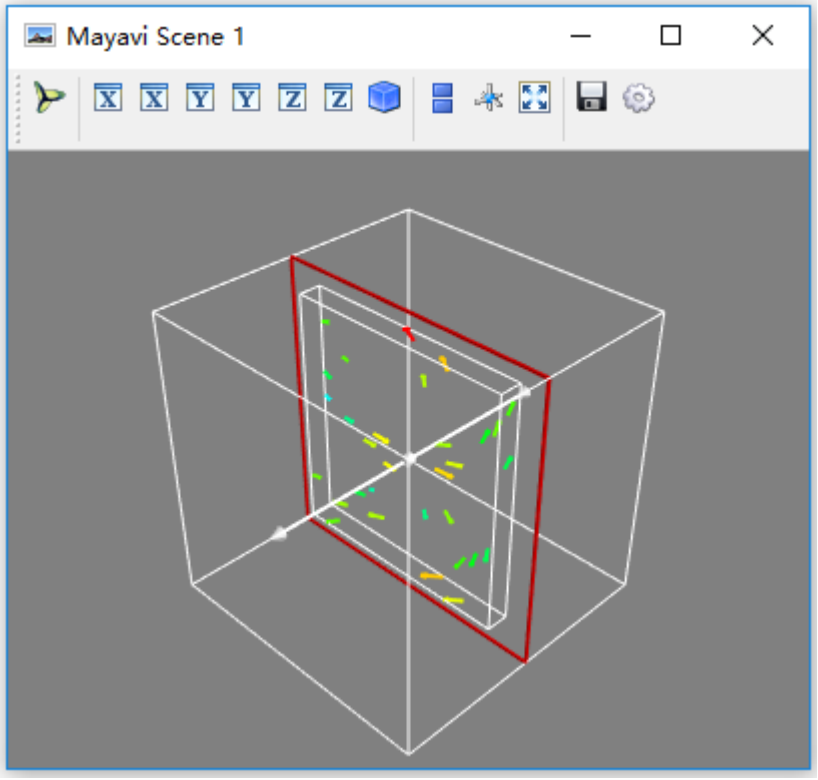
Masking Vector采样



Cut Plane切面

```
from mayavi import mlab
src = mlab.pipeline.vector_field(u, v, w)
mlab.pipeline.vector_cut_plane(src, mask_points=10, scale_factor=2)

mlab.show()
```

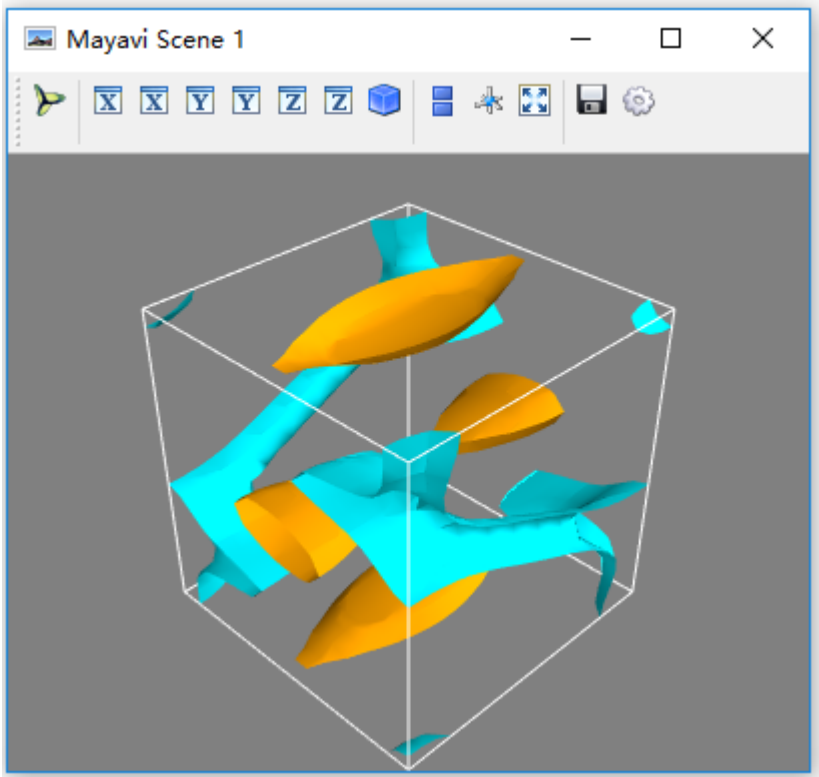
Cut Plane切面



级数的等值面

```
from mayavi import mlab
src = mlab.pipeline.vector_field(u, v, w)
magnitude = mlab.pipeline.extract_vector_norm(src)
mlab.pipeline.iso_surface(magnitude, contours=[2.0, 0.5])
mlab.outline()

mlab.show()
```

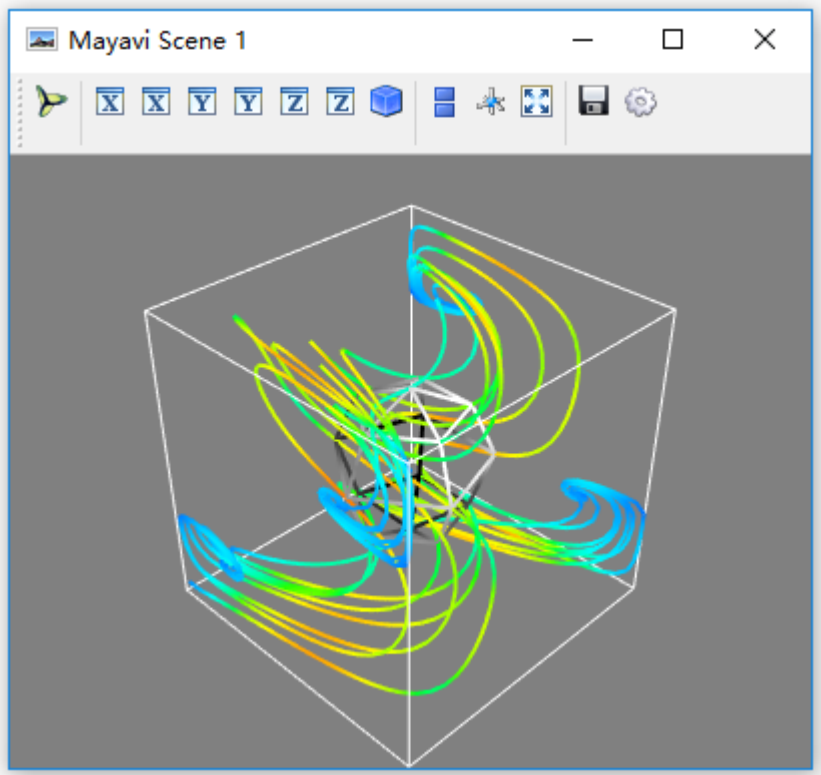
级数的等值面



Flow可视化

```
from mayavi import mlab
flow = mlab.flow(u, v, w, seed_scale=1,
                          seed_resolution=5,
                          integration_direction='both')
mlab.outline()

mlab.show()
```

级数的等值面



复合观测方法

```
iso = mlab.pipeline.iso_surface(magnitude, contours=[2.0, ], opacity=0.3)
vec = mlab.pipeline.vectors(magnitude, mask_points=40,
                                       line_width=1,
                                       color=(0.8, 0.8, 0.8),
                                       scale_factor=4.)
flow = mlab.pipeline.streamline(magnitude, seedtype='plane',
                                           seed_visible=False,
                                           seed_scale=0.5,
                                           seed_resolution=1,
                                           linetype='ribbon',)
vcp = mlab.pipeline.vector_cut_plane(magnitude, mask_points=2,
                                           scale_factor=4,
                                           colormap='jet',
                                           plane_orientation='x_axes')
```

符合观测方法