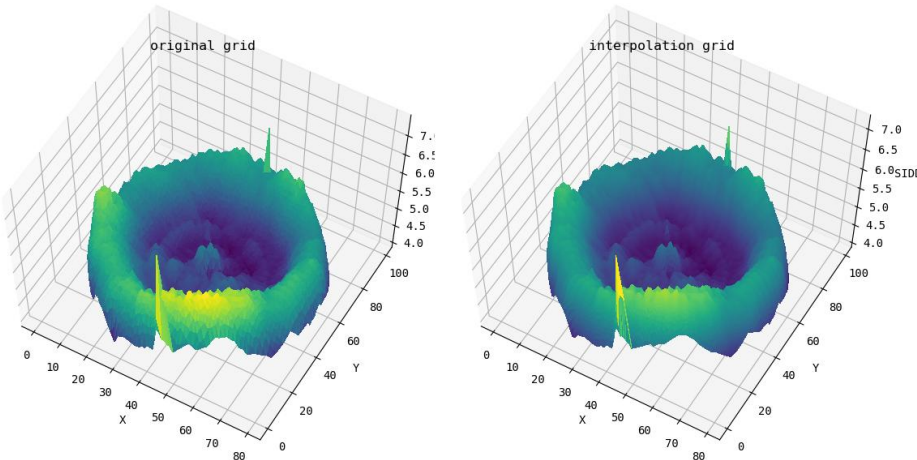


# Resolution Improvement

除了稀疏資料點,也能使用 `griddata` 提升 3D 曲面解析度,左邊是原始資料點,右邊是用內插法將資料點解析度提升到 200x200.



```
from mpl_toolkits.mplot3d import Axes3D
import matplotlib.pyplot as plt
from scipy.interpolate import griddata
import numpy as np
import pandas as pd
import matplotlib.gridspec as gridspec

# load data
df = pd.read_csv(f'{path}/CSV/sidd_uniformity.csv').dropna()
x,y,z = df.values.T

###
view = (60,300)
G =
gridspec.GridSpec(nrows=1,ncols=2,width_ratios=[0.5,0.5],left=0.01,right=0.95,
top=0.95,bottom=0.1,wspace=0.01)
fig = plt.figure(figsize=(12,6))
ax1 = fig.add_subplot(G[0,0],projection='3d',title='original grid')
ax2 = fig.add_subplot(G[0,1],projection='3d',title='interpolation grid')

# original grid
ax1.plot_trisurf(x,y,z,cmap=plt.cm.viridis,alpha=1,antialiased=False,linewidth
=0,edgecolors='none')
ax1.set_xlabel('X')
```

```
ax1.set_ylabel('Y')
ax1.set_zlabel('SIDD')
ax1.view_init(*view)
ax1.dist = 9

# interpolation grid
gx,gy = np.mgrid[x.min():x.max():200j,y.min():y.max():200j]
gz = griddata(np.array([x,y]).T,z,(gx,gy),method='linear')
d = pd.DataFrame(np.array([gx.ravel(),gy.ravel(),gz.ravel()]).T).dropna()
ax2.plot_trisurf(*d.values.T,alpha=1,cmap=plt.cm.viridis,antialiased=False,edgecolors='none')
ax2.set_xlabel('X')
ax2.set_ylabel('Y')
ax2.set_zlabel('SIDD')
ax2.view_init(*view)
ax2.dist = 9
```

注意 Nan 必須剔除否則 3D 曲面會有破洞且無法被渲染上色, 而程式碼第 30 行則是透過 Pandas DataFrame 將內插值為 Nan 刪除的技巧.