

# Fun with IDL, Playing with IDL

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- 주요 업무 : 우주기상, IDL 교육 및 컨설팅, 외부 출강(경희대 우주과학과)
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# What is IDL?

**I**nteractive  
**D**ata  
**L**anguage

# IDL의 활용 포인트

- 직관적이고 사용자 친화적인 프로그래밍 체계
- 다양한 방식의 계산 및 자료 처리 기능
- 1~3차원을 넘나드는 다양한 방법의 가시화 기능
- 다양한 형식의 결과 파일 생성 기능
- 강력한 외부 라이브러리들의 존재

# 천문/우주과학 분야

- 각종 천체 관측자료(이미지, 분광 등)의 처리 및 분석
- 위성에 탑재된 또는 지상에 설치된 관측 장비로부터 다양한 형식의 관측자료 획득
- 다양한 물리적 상황(천체 운동, 지자기 모델, 우주 진화 등)에 대한 시뮬레이션 및 가시화
- IDL 기본 라이브러리 외에 이 분야에 특화된 별도의 프로그램 램 라이브러리들이 많이 활용됨

How many IDL users in here?

Having fun with using IDL?

Do you think I'm really having  
fun with using IDL? **Yes!!**

# Having fun with IDL? How?

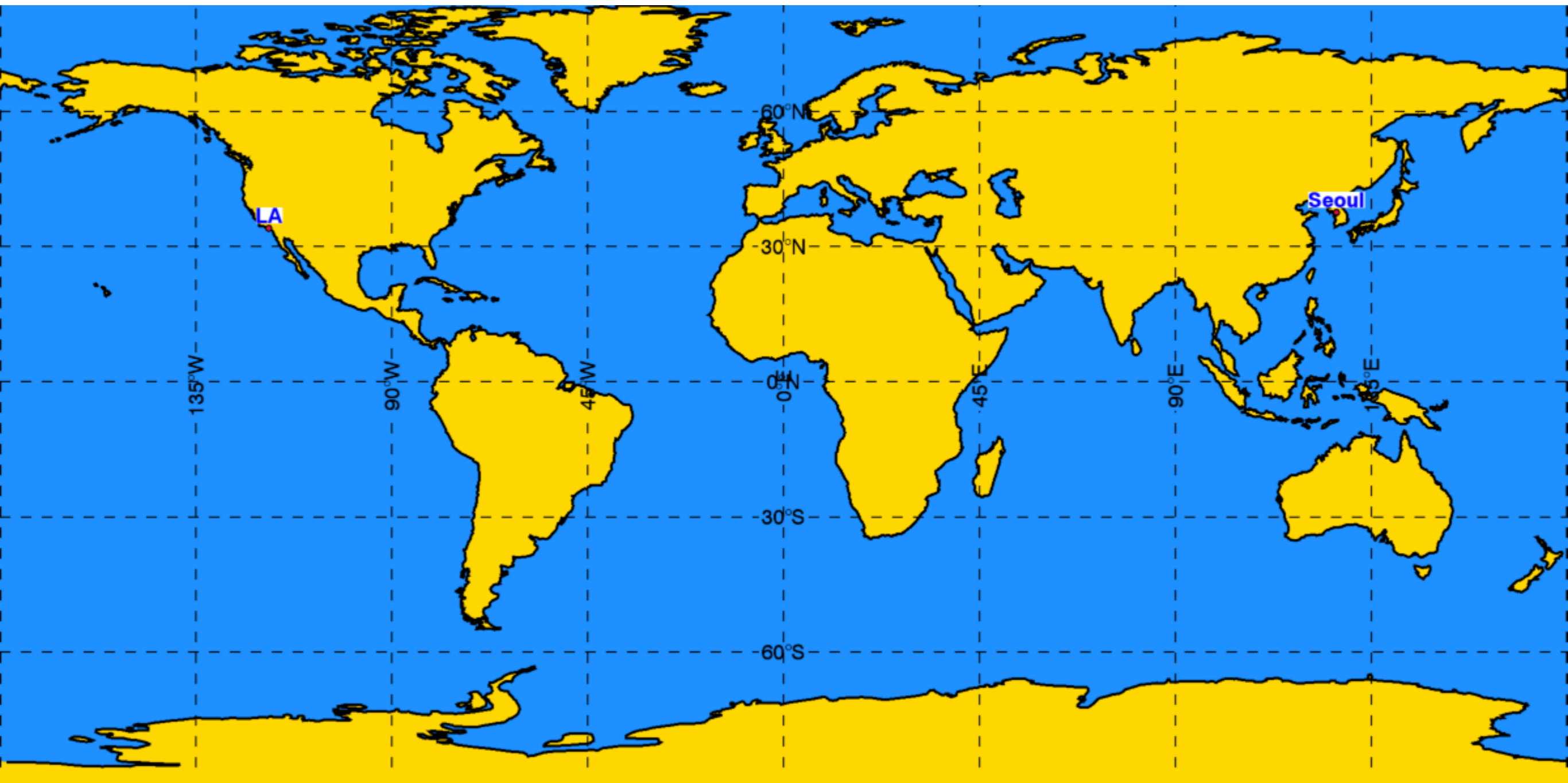
문제에 대한 이해

문제에 대한 도전

문제에 대한 관심

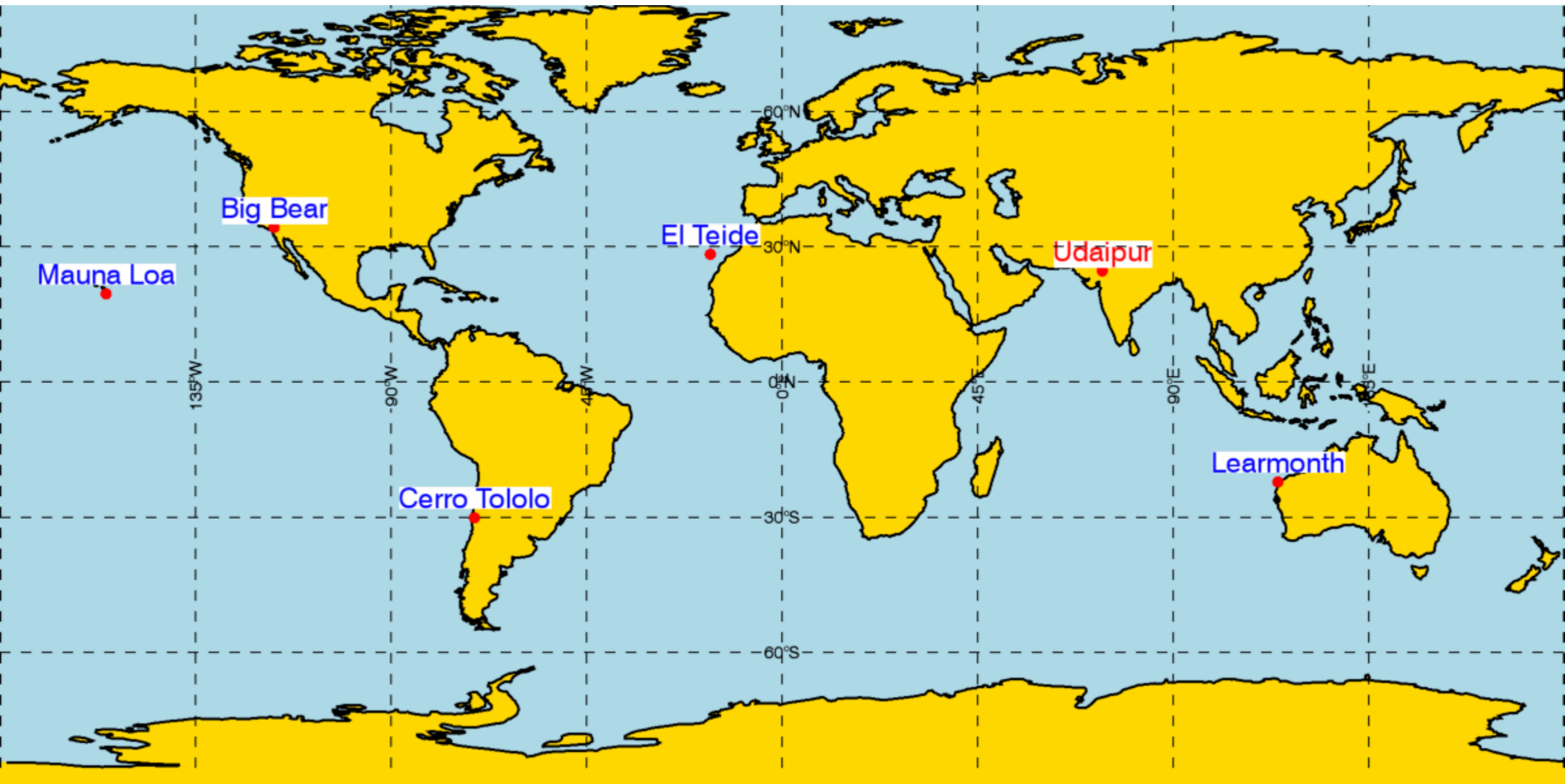
일거리라는 생각 이전에 관심과 흥미의 대상이 되어야 함

# Drawing a Map





# Annotations on a Map



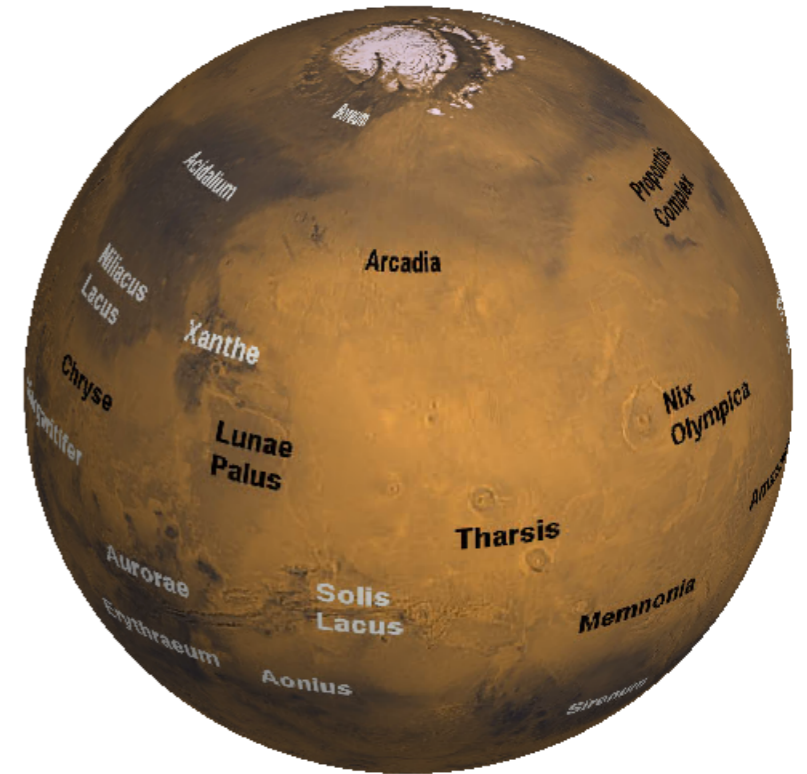
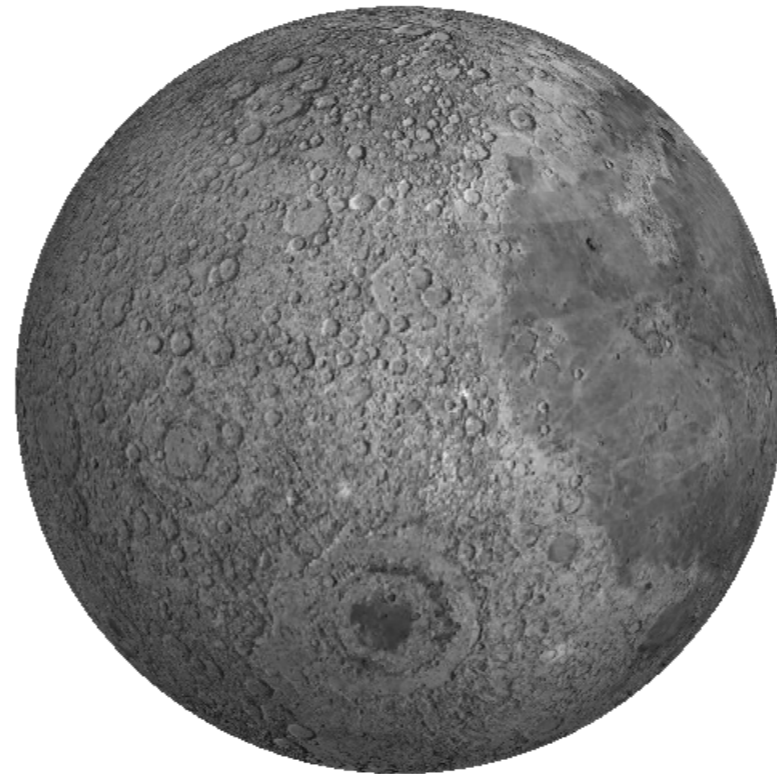
# GONG H-alpha Network

- H-alpha Images observed at some selected ground observatories
- Routinely gathered, summarized and distributed at GONG H-alpha archive website
- Learmonth (Australia), Udaipur (India), El Teide (Spain), Cerro Tololo (Chile), Big Bear (United States), Mauna Loa (Hawaii)

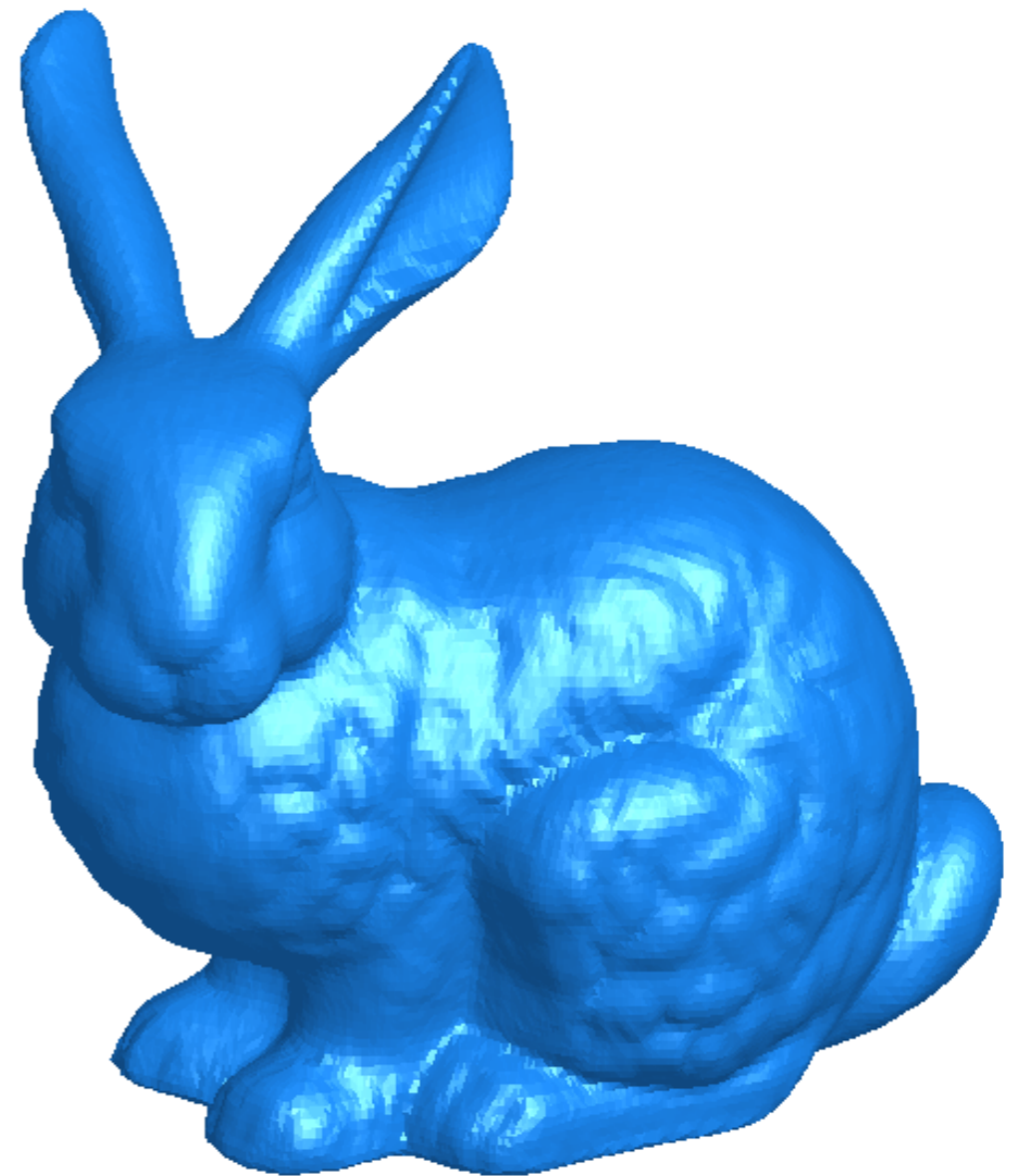
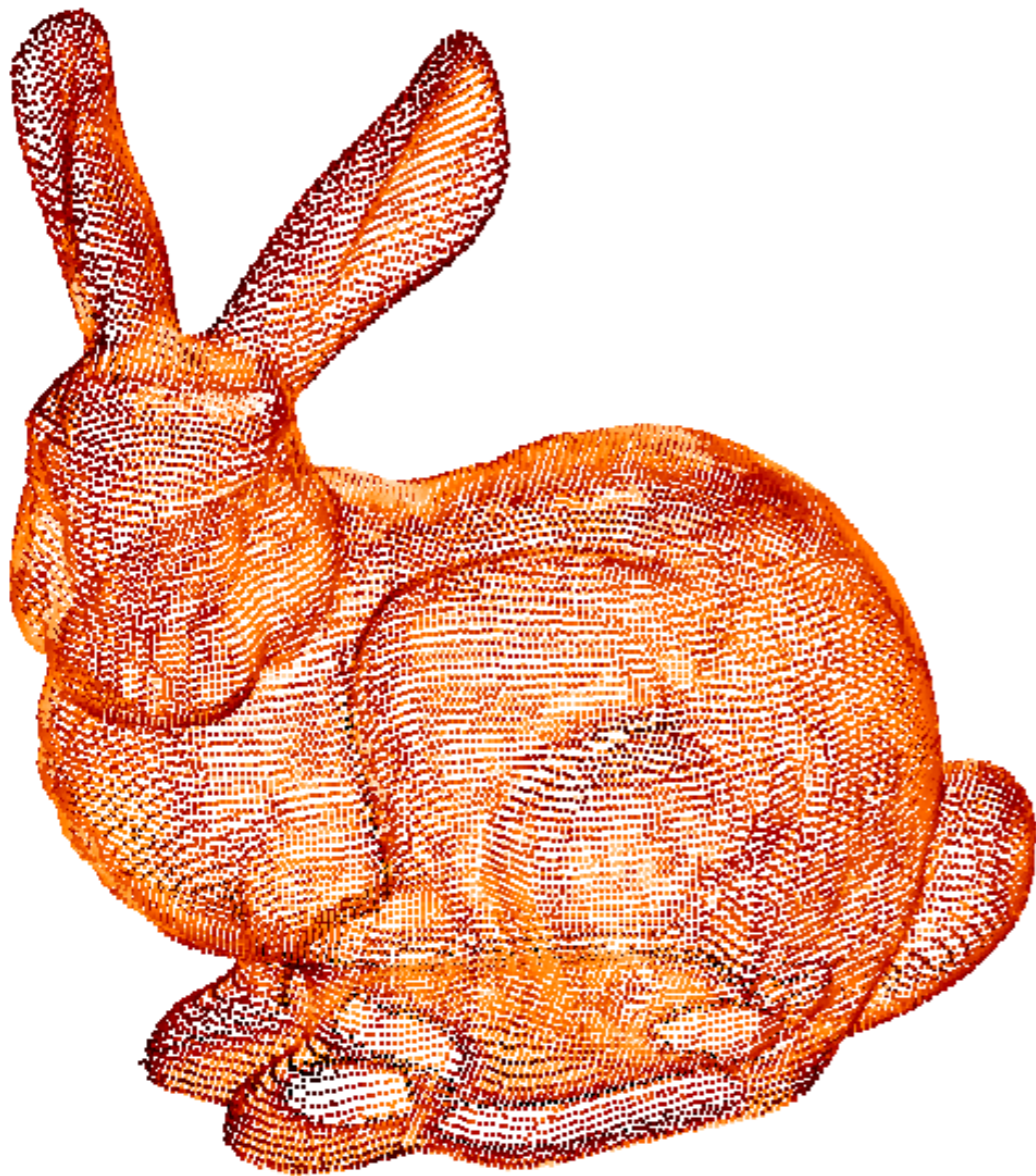
# Annotations on a Globe Map



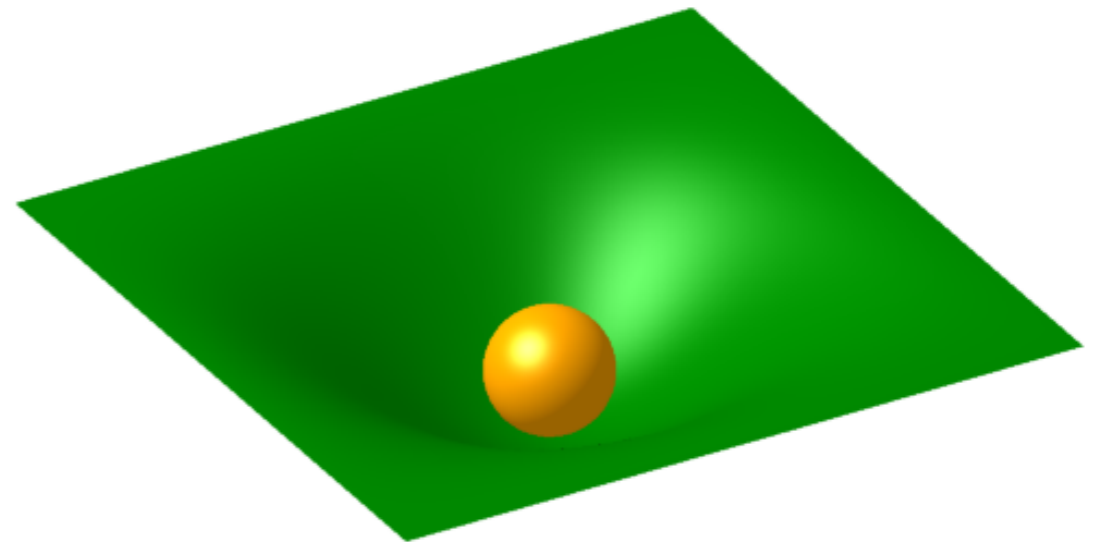
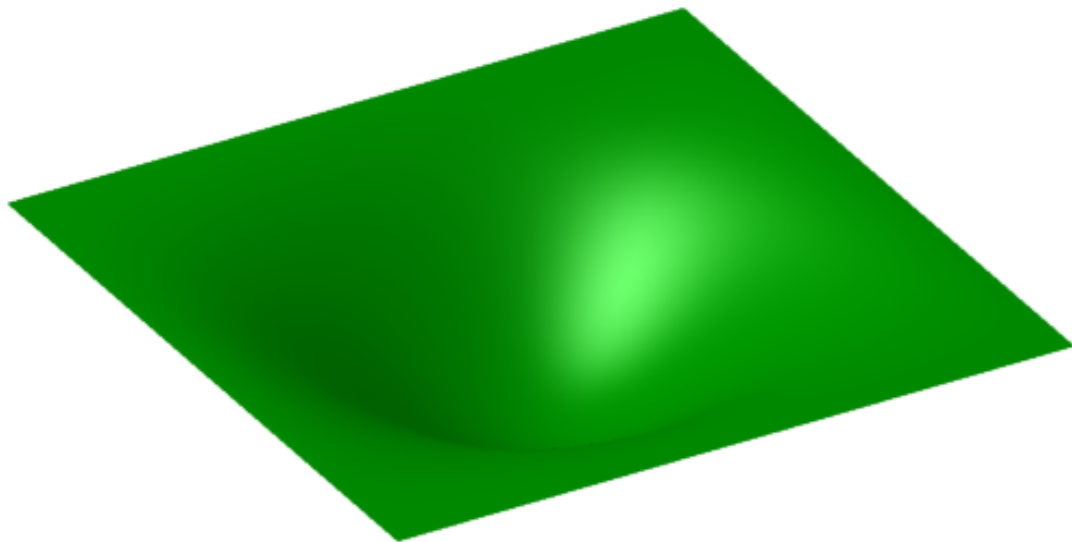
# Implementing Planetary Globes



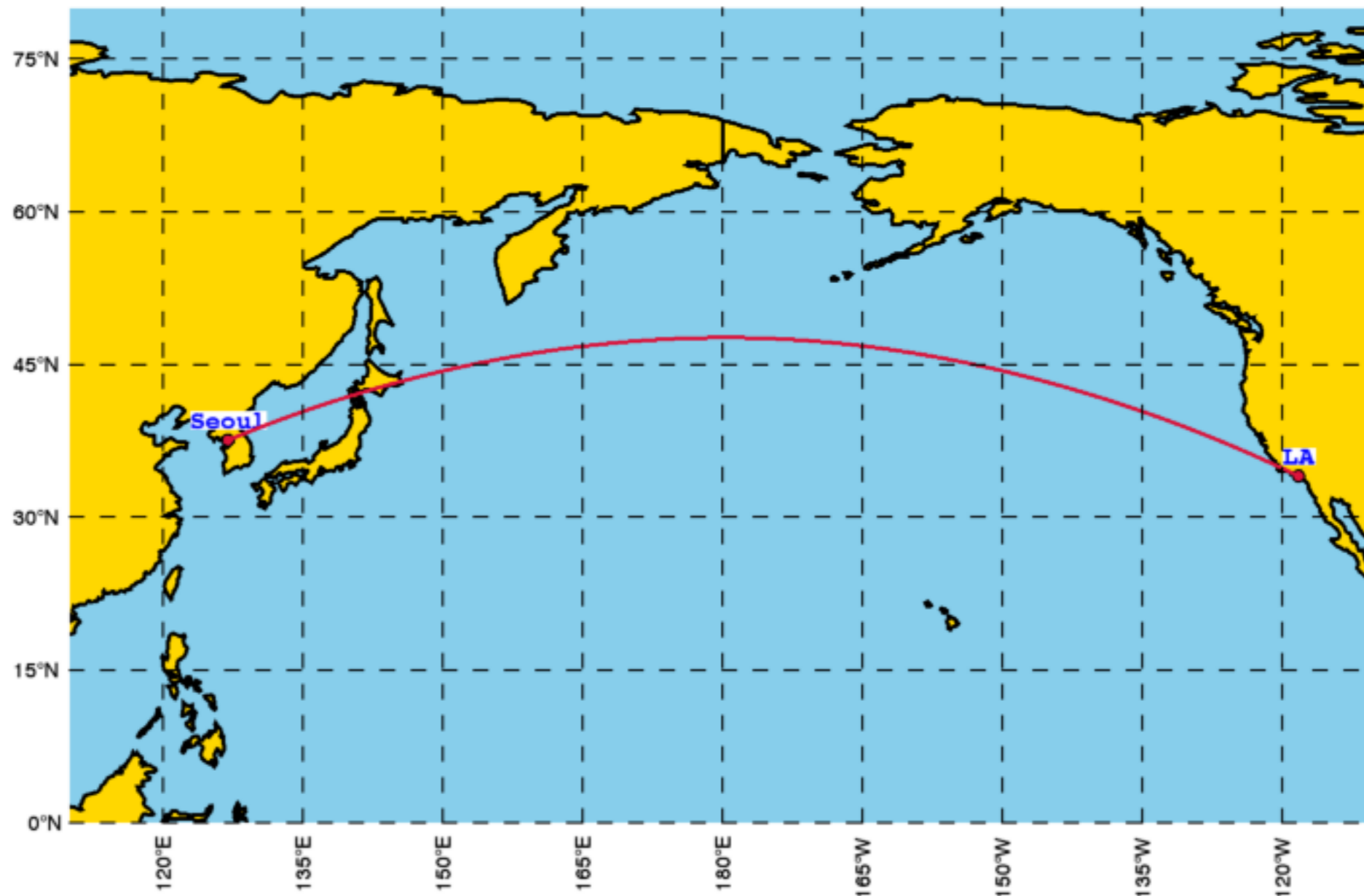
# 3D Polygon Reconstruction



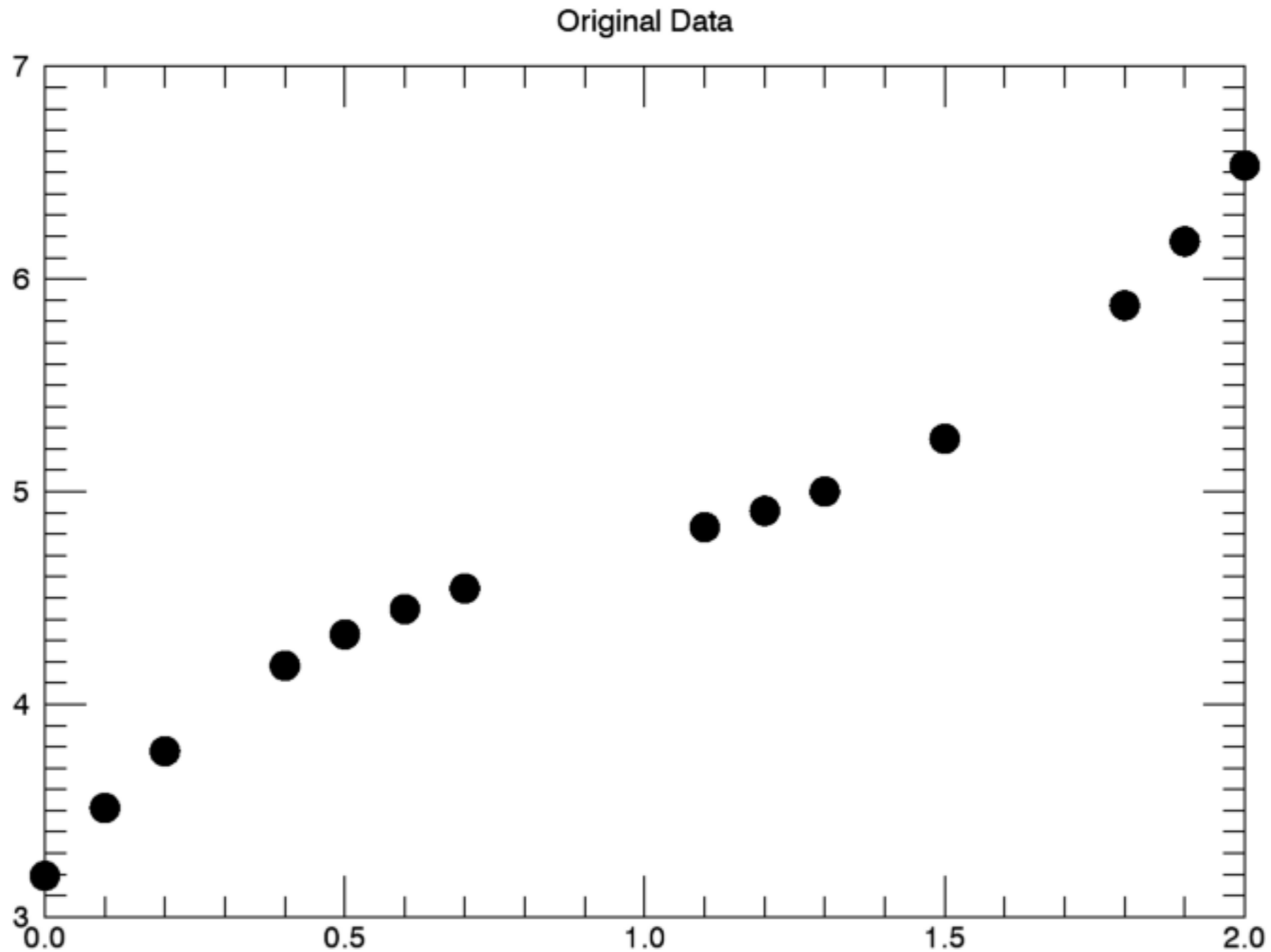
# Bounce on Trampoline Surface



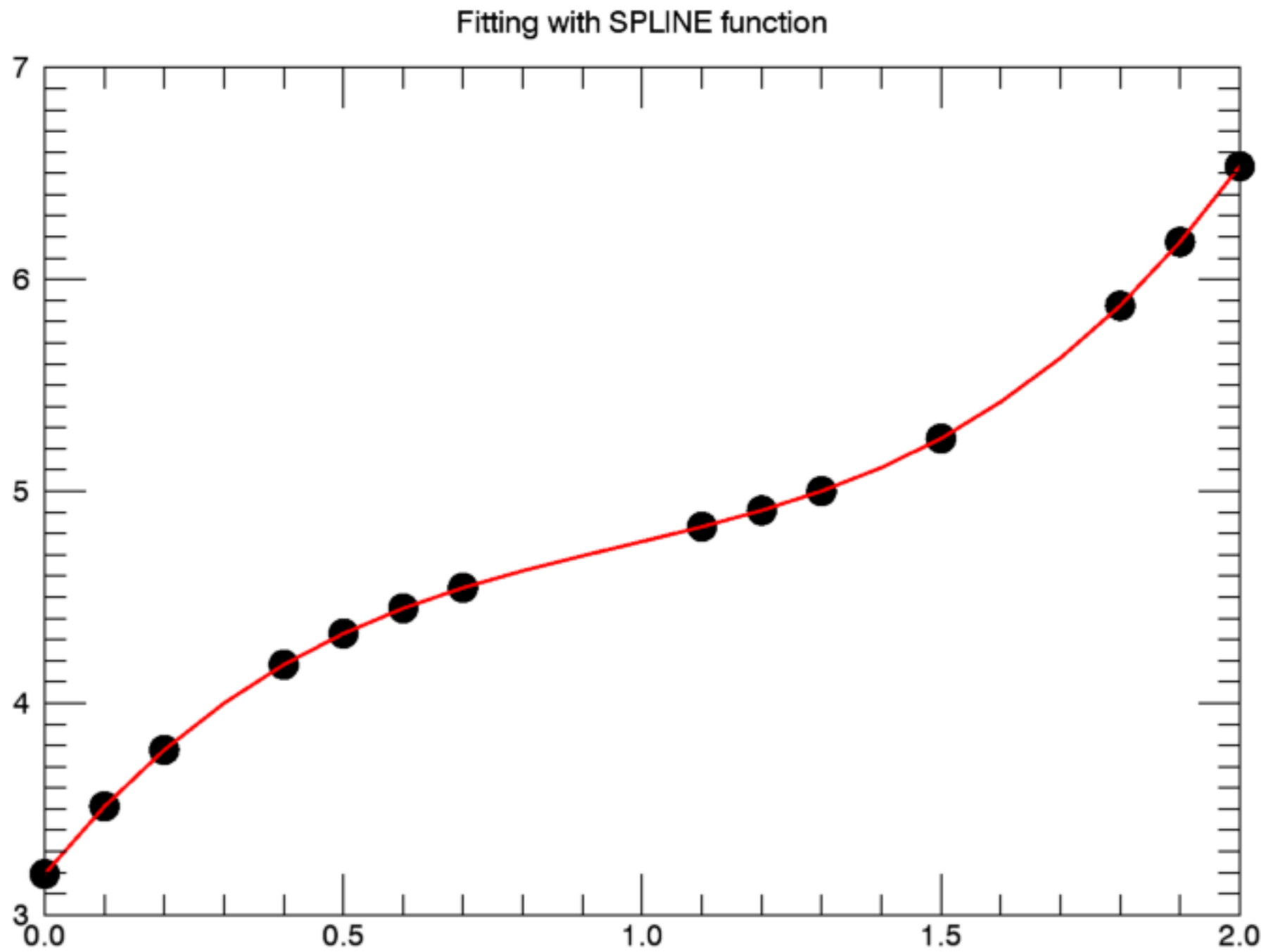
# Flight Path on a Global Map



# Estimation of Missing Data (1-D)







SPLINE function

# Estimation of Missing Data (2-D)

## ESTIMATOR\_FILTER

Noise reduction by analyzing neighborhood pixels

## GRIDDATA

Filling the missing data by the following algorithms

Inverse Distance (default)	Natural Neighbor
Kriging	Nearest Neighbor
Linear	Polynomial Regression
Minimum Curvature	Quintic
Modified Shepard's	Radial Basis Function

Original Image



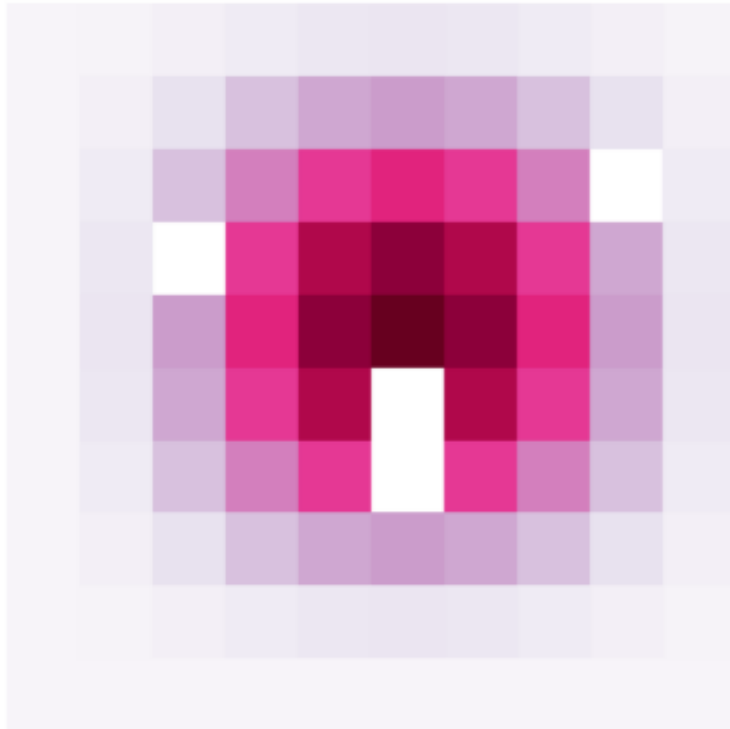
Added Noise



Using ESTIMATOR\_FILTER, /MEDIAN

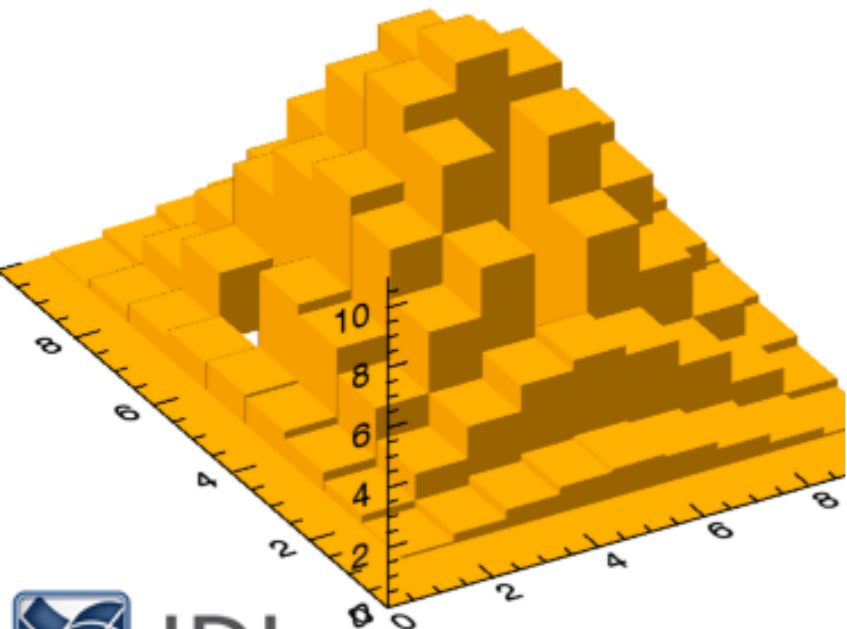


Original

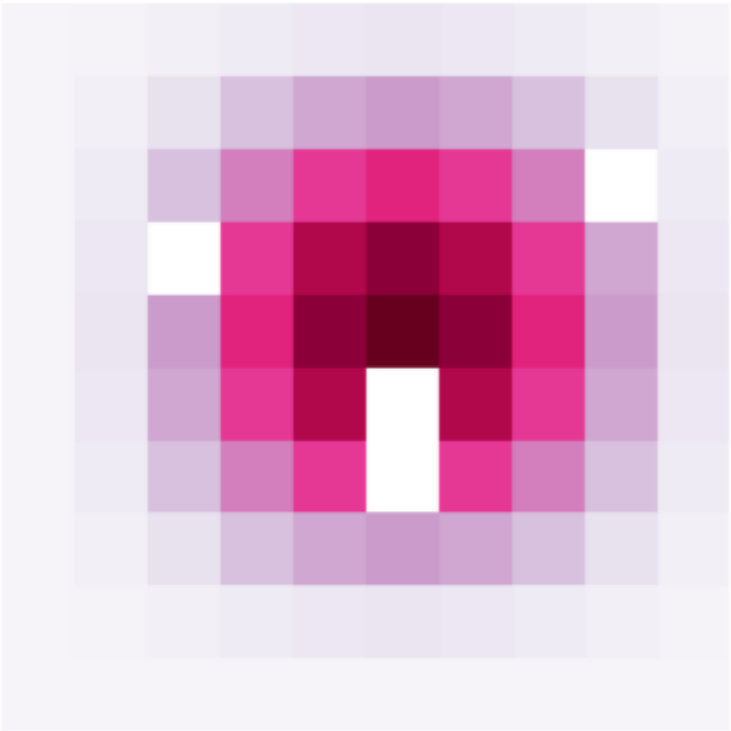


# Applying ESTIMATOR\_FILTER function

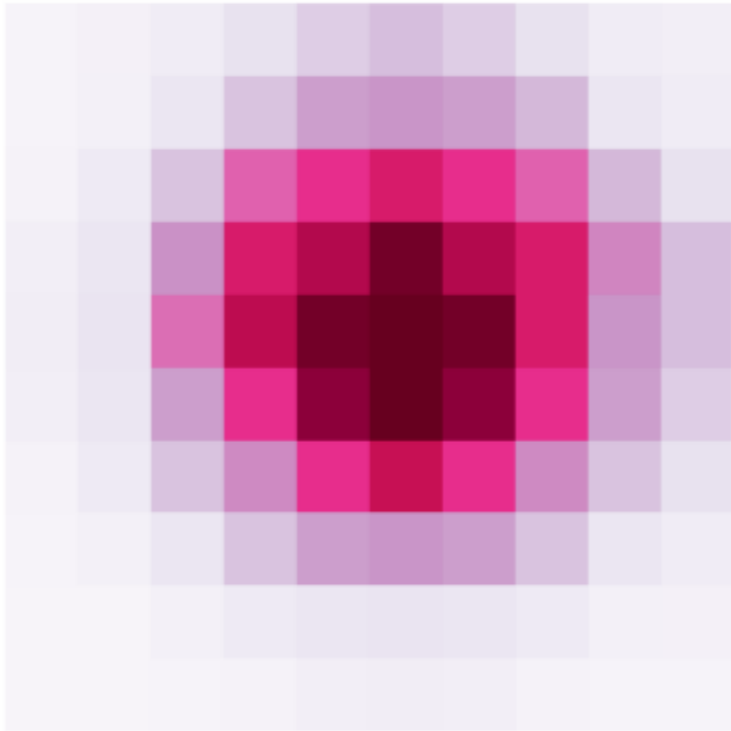
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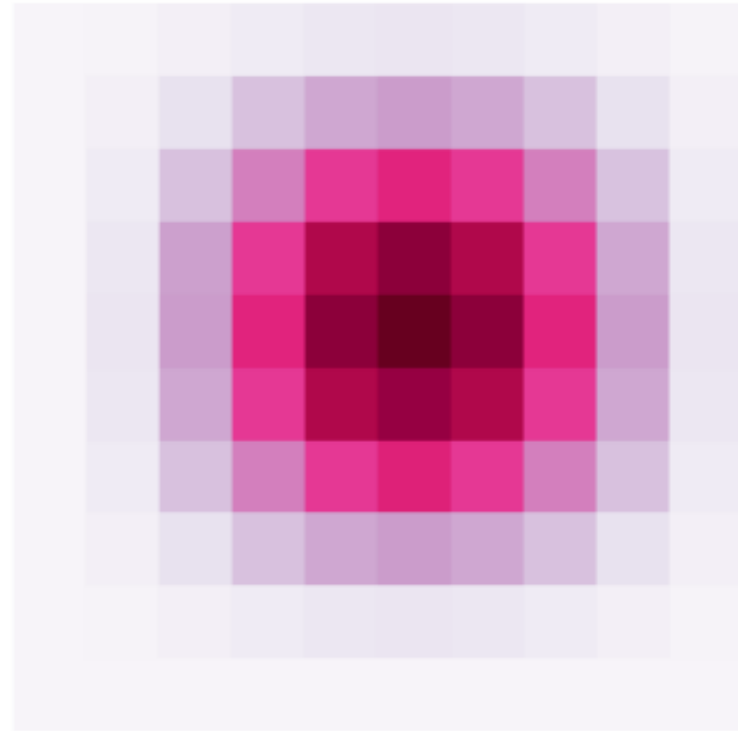
Original



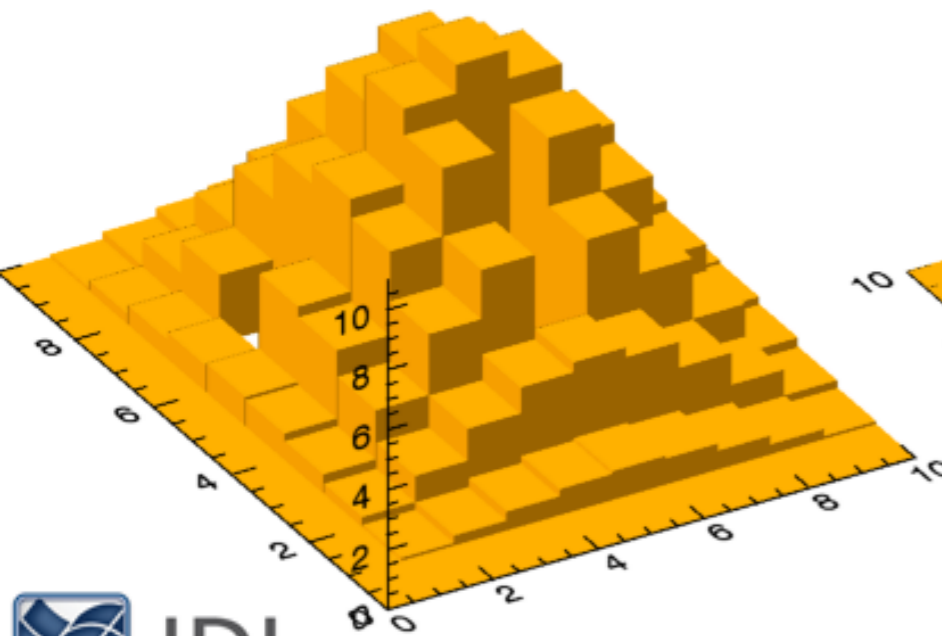
Filtered



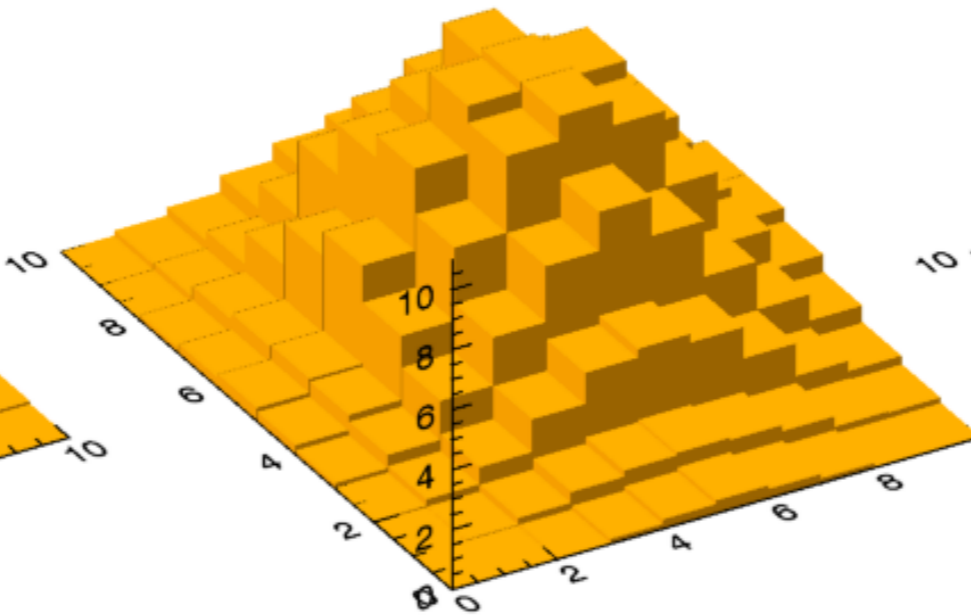
Reconstructed Original



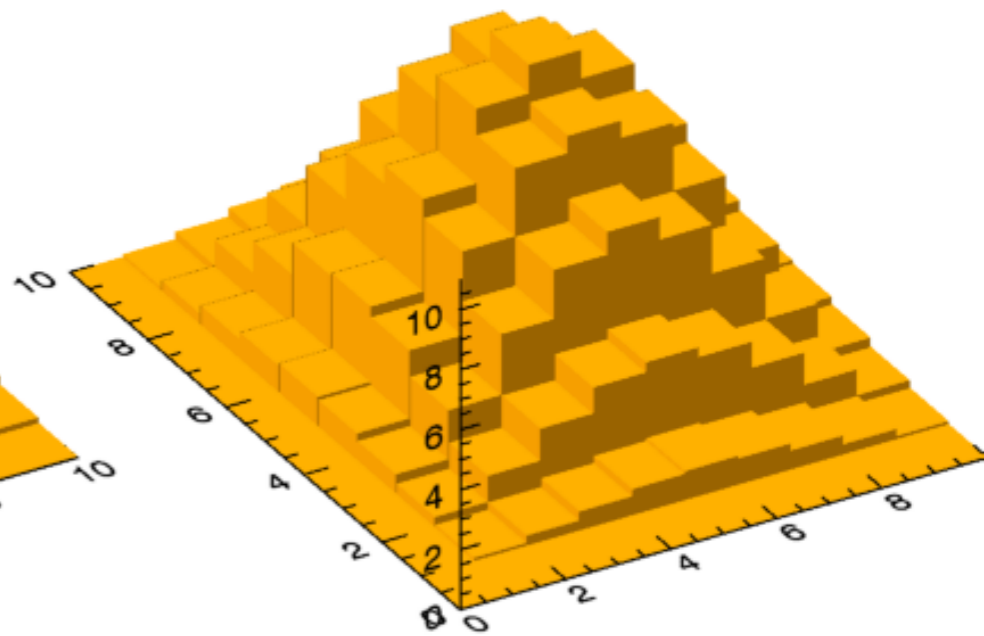
Original



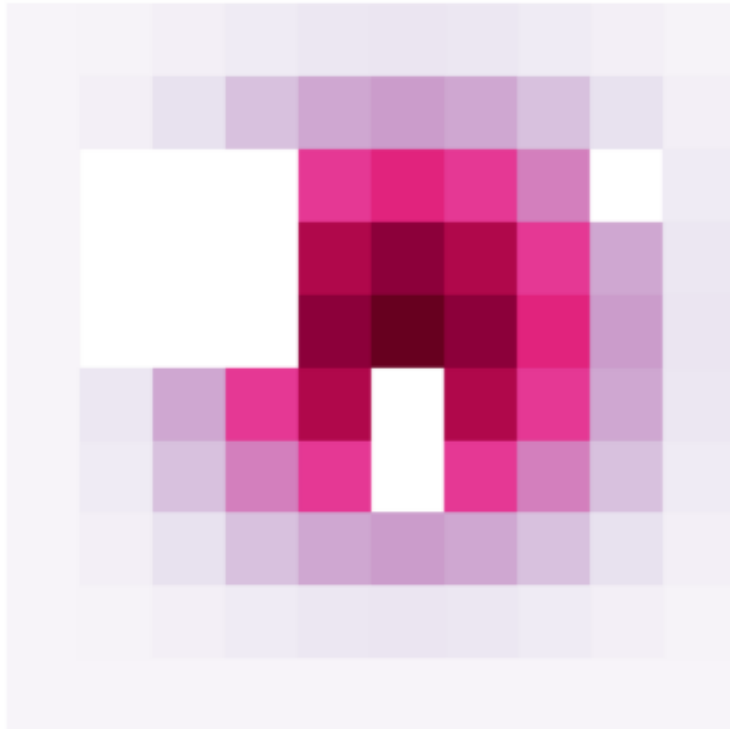
Filtered



Reconstructed Original

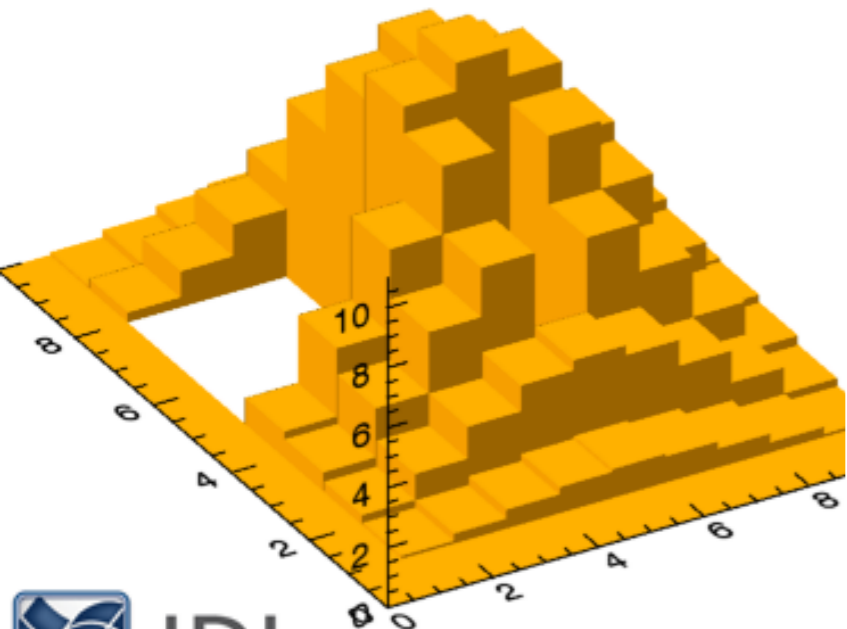


Original



# Applying GRIDDATA function

Original

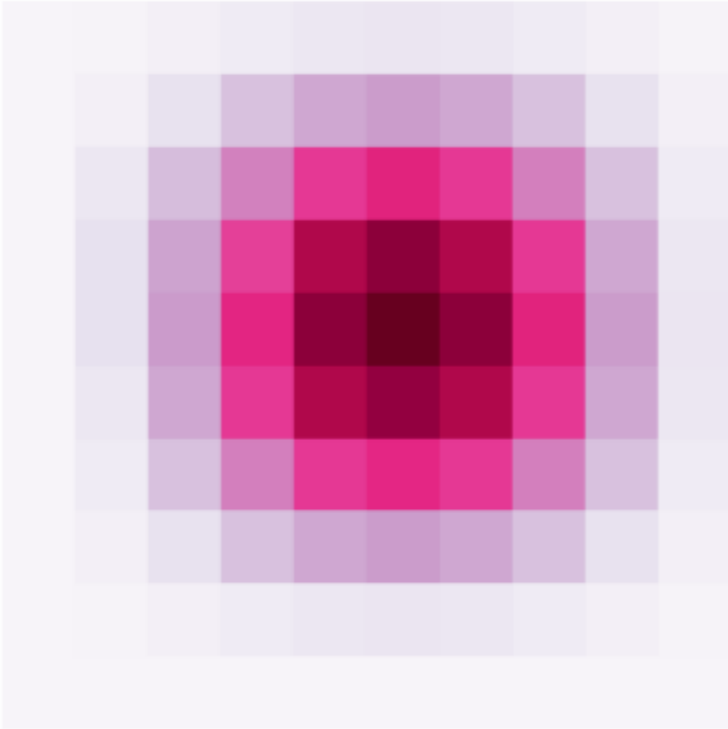




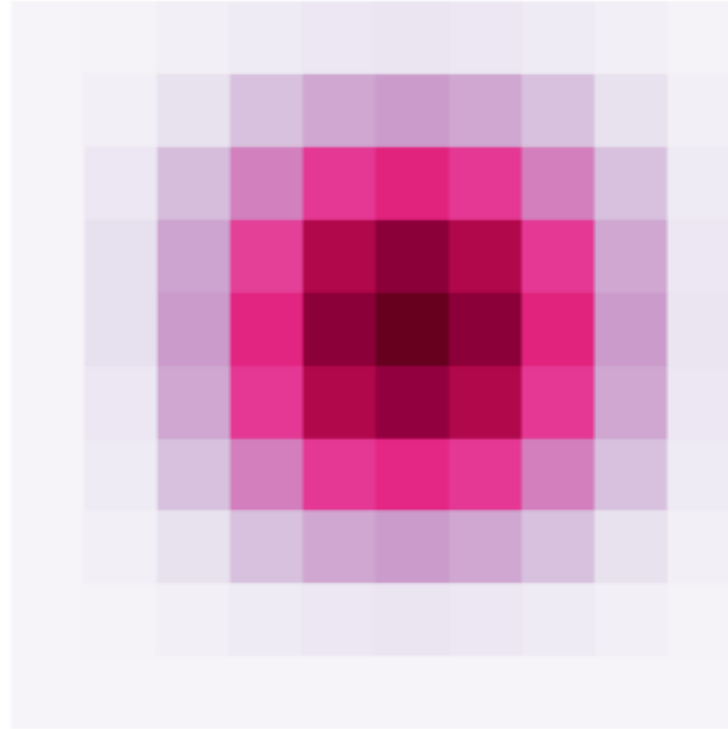
Original



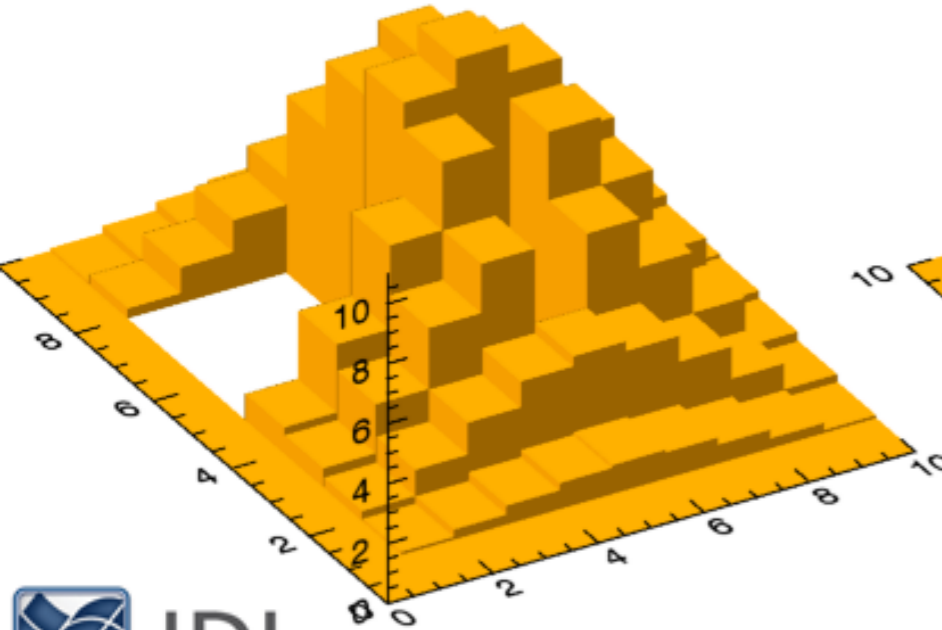
Filtered



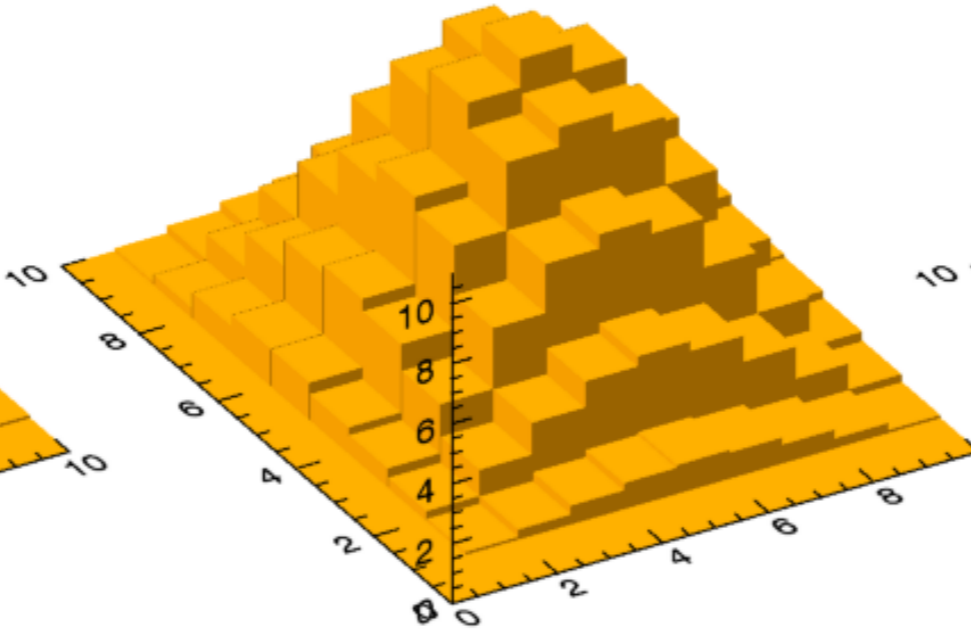
Reconstructed Original



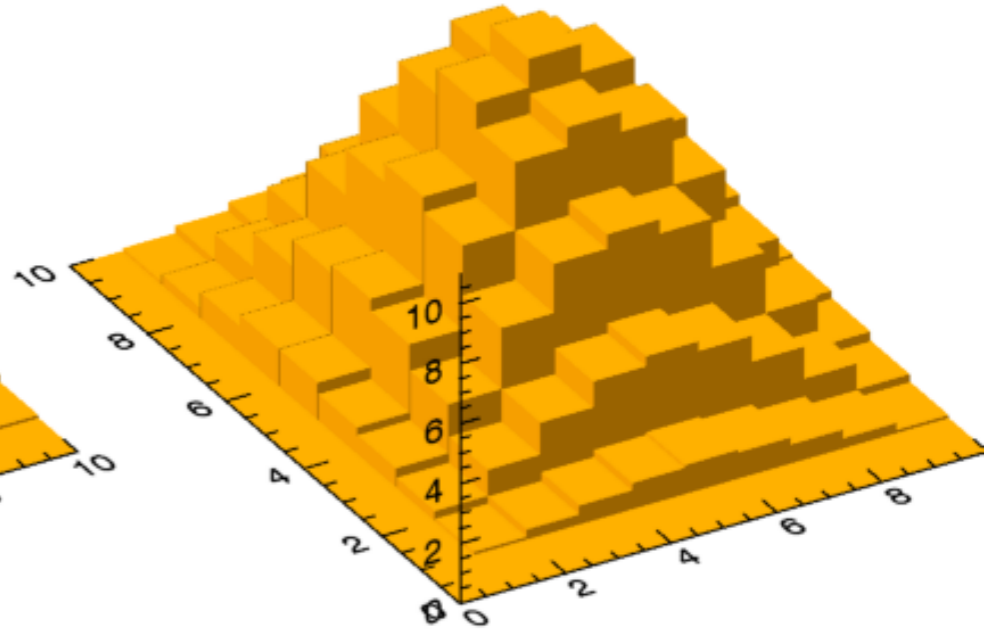
Original



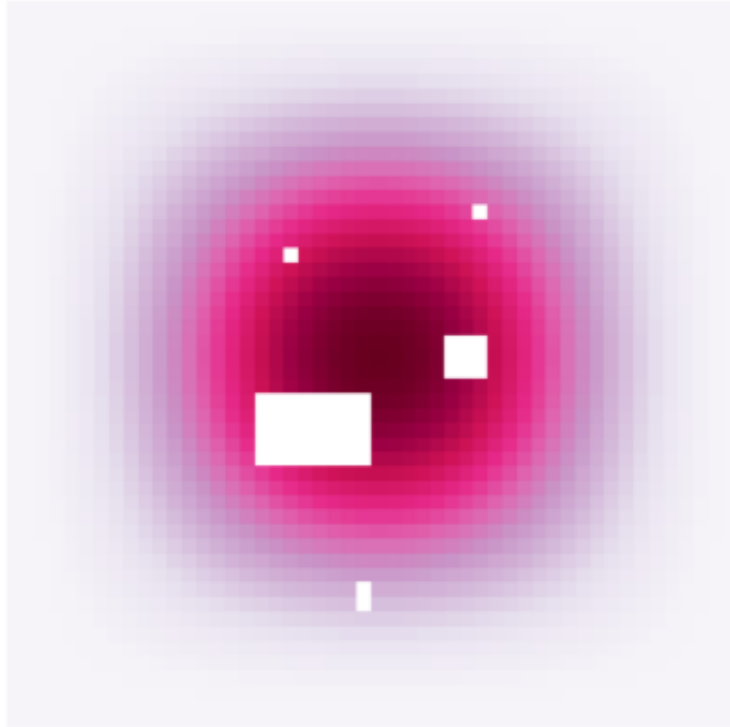
Filtered



Reconstructed Original

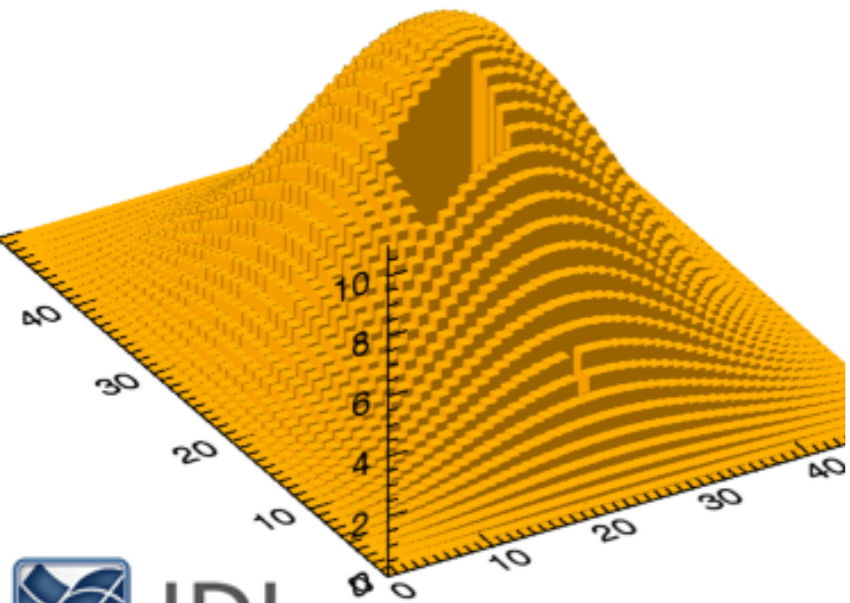


Original

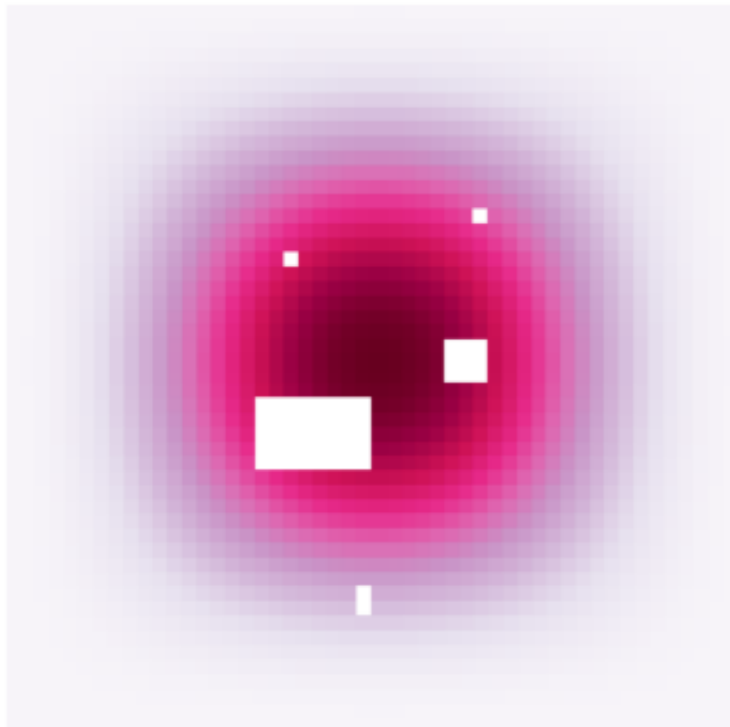


# Applying GRIDDATA function

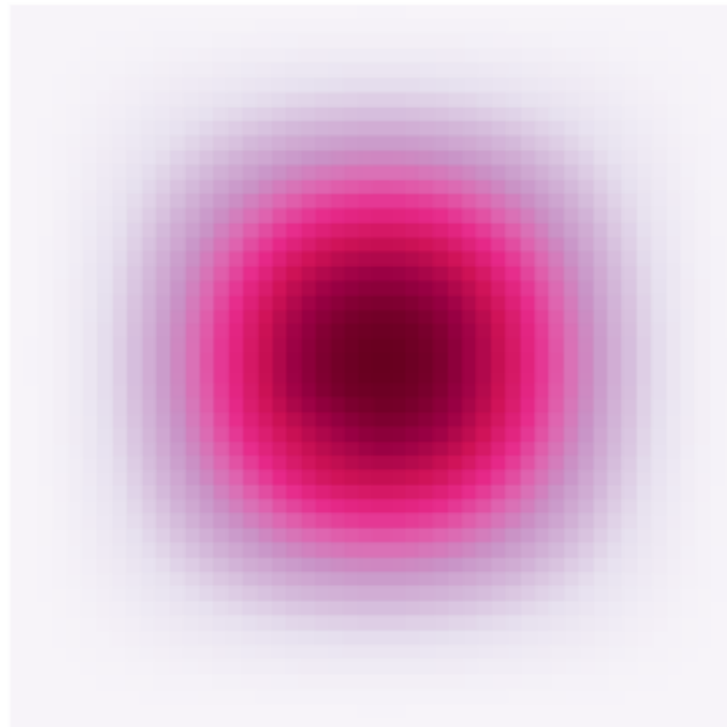
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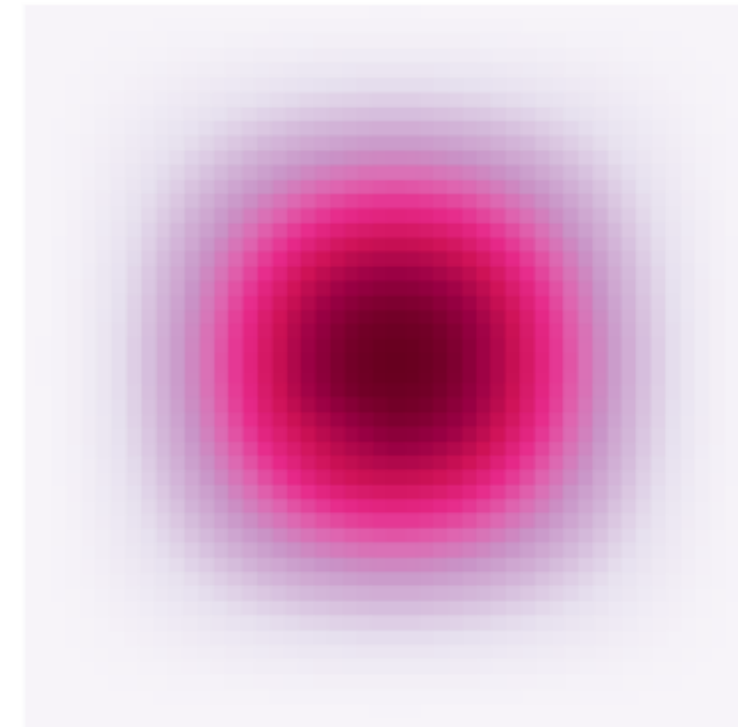
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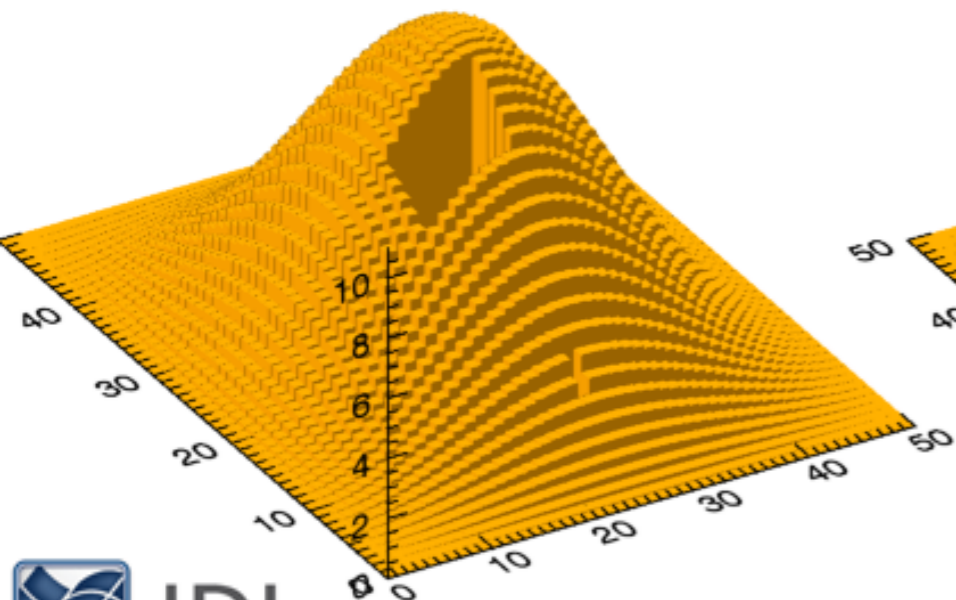
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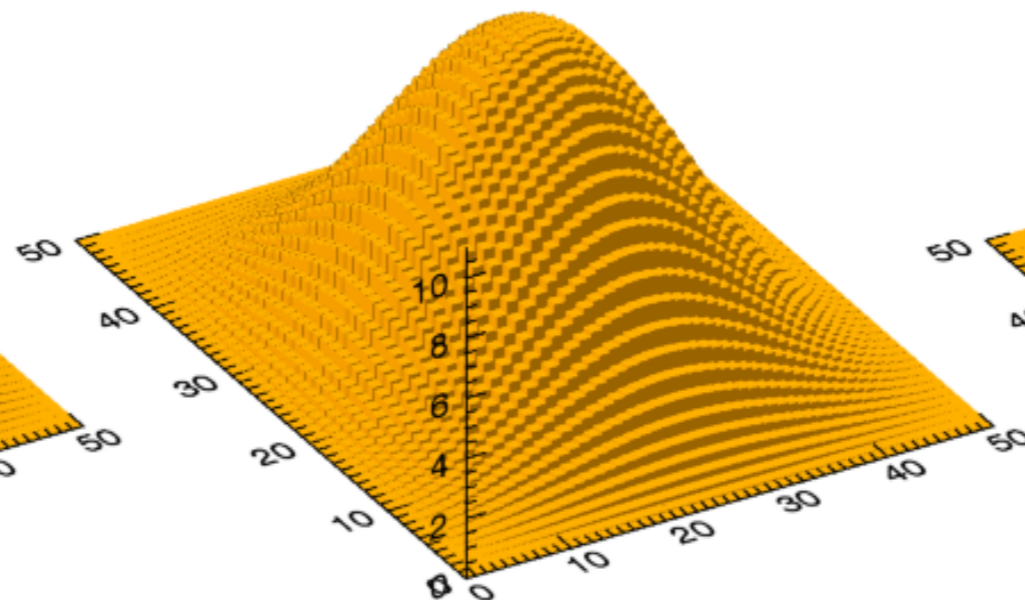
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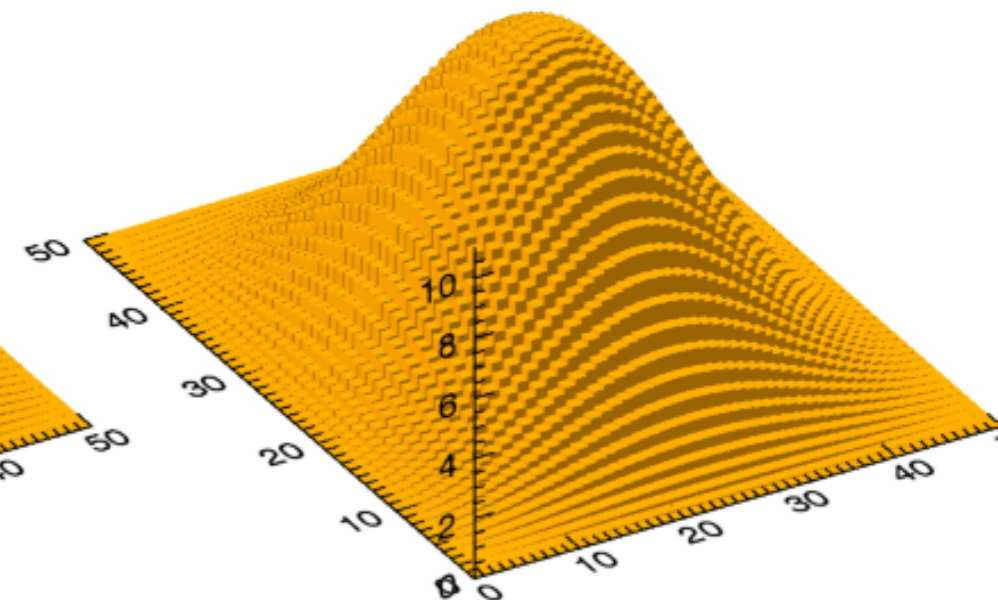
Original



Filtered



Reconstructed Original



Science

+

Engineering  
Programming



Scientific Engineering  
Scientific Programming

# Related Links

Map Drawing  
Mapping on Sphere

<http://blog.daum.net/swrush/313>

<http://blog.daum.net/swrush/314>

3D Polygon  
Reconstruction

<http://blog.daum.net/swrush/308>

Flight Path on Map

<http://blog.daum.net/swrush/301>

Spline Interpolation

<http://blog.daum.net/swrush/221>