Threshold Filters with Surfer, Oasis Montaj, and USGS GX Extensions

11-27-2008

Steps:

1. Choose your residual map, I'll assume it is a Surfer grid.

2. Start in **Oasis Montaj**, load the USGS GX extensions, and use:

- USGSV/Grid Fourier Filtering/Step-by-Step/**Extend Grid for FFT**
  and increase the grid size (20-25%; 25% is default). Save the result as a Surfer file if you want to look at it in Surfer.

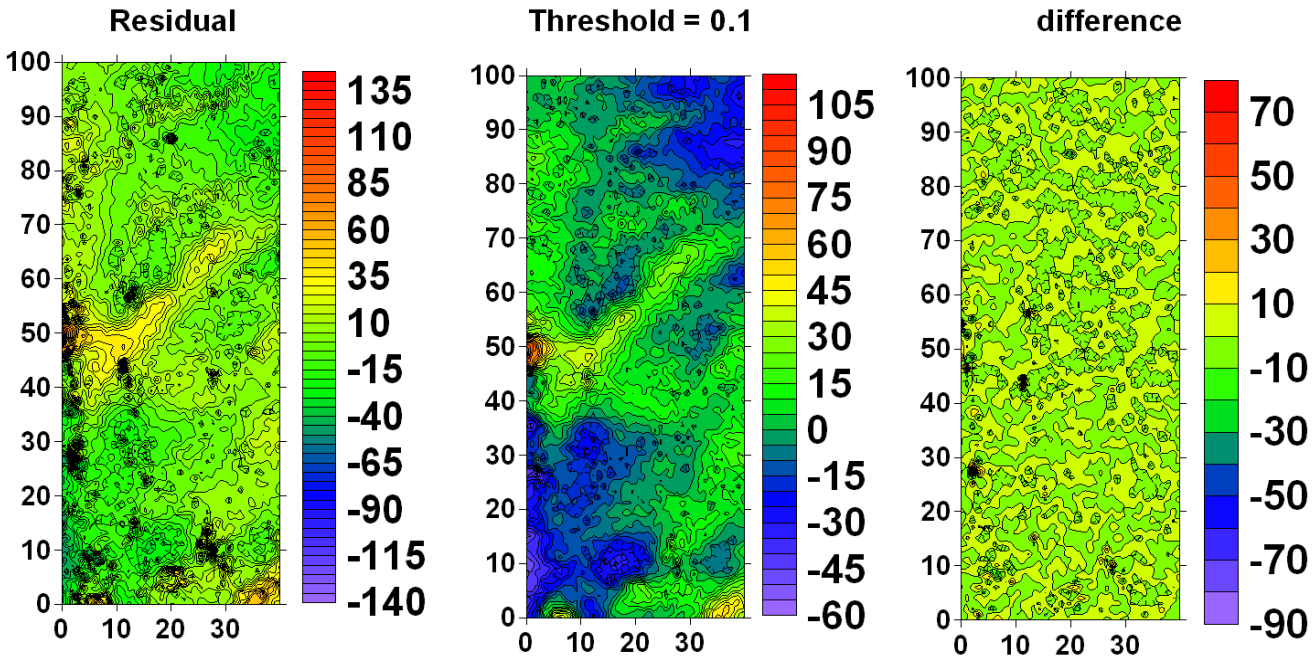
- USGSV/Grid Fourier Filtering/Step-by-Step/**Forward Fourier Transform.** Save the result as a Surfer file (e.g., FFT.grd)

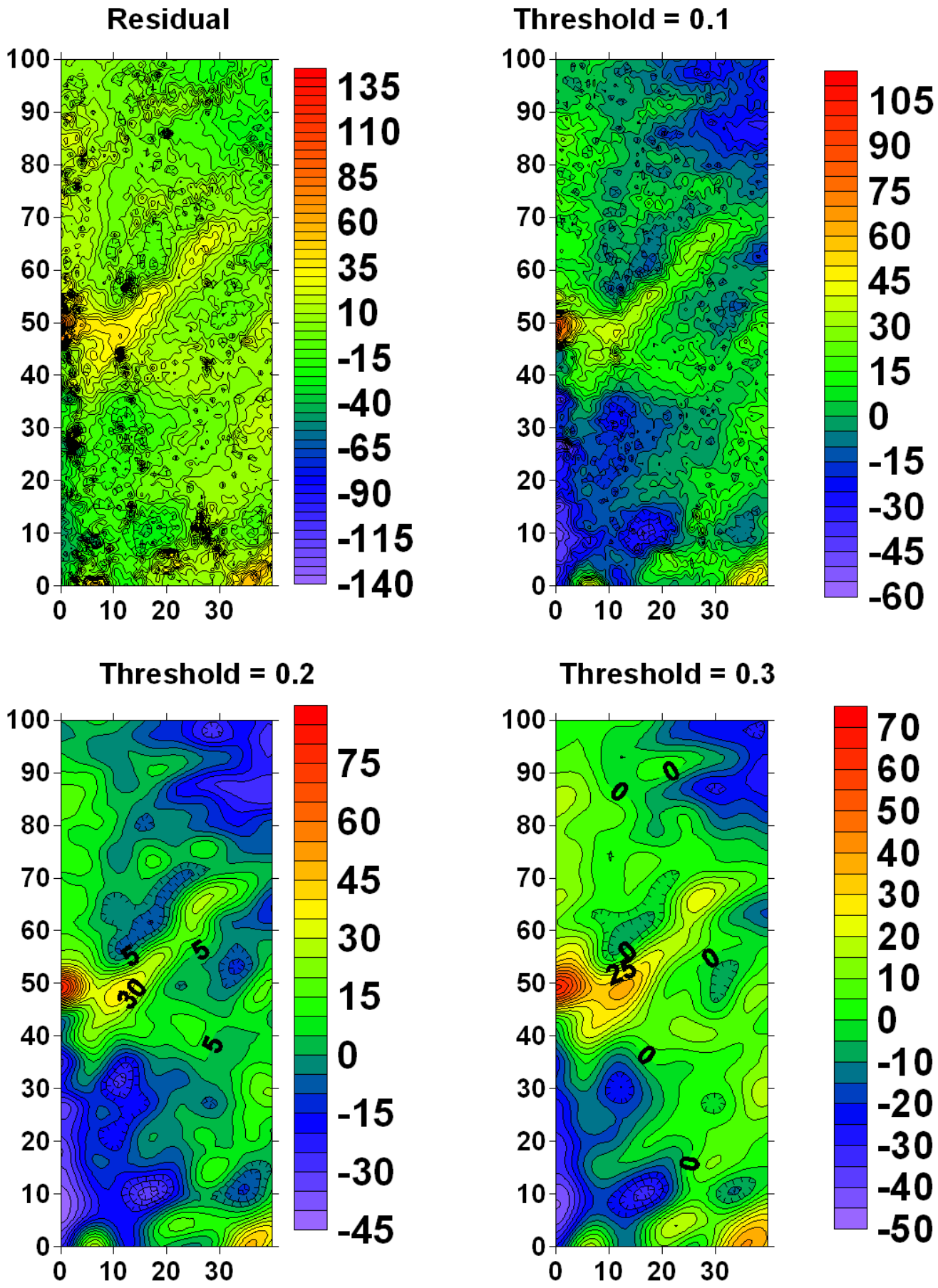
- In **SURFER**, Grid/Math, open the Fourier Transformed file (FFT.grd) from above. In the "Enter a Function of the form C=f(A,B)" window, enter the threshold filter LOGICAL IF function where the numerical value is the threshold cutoff (0.05 below):

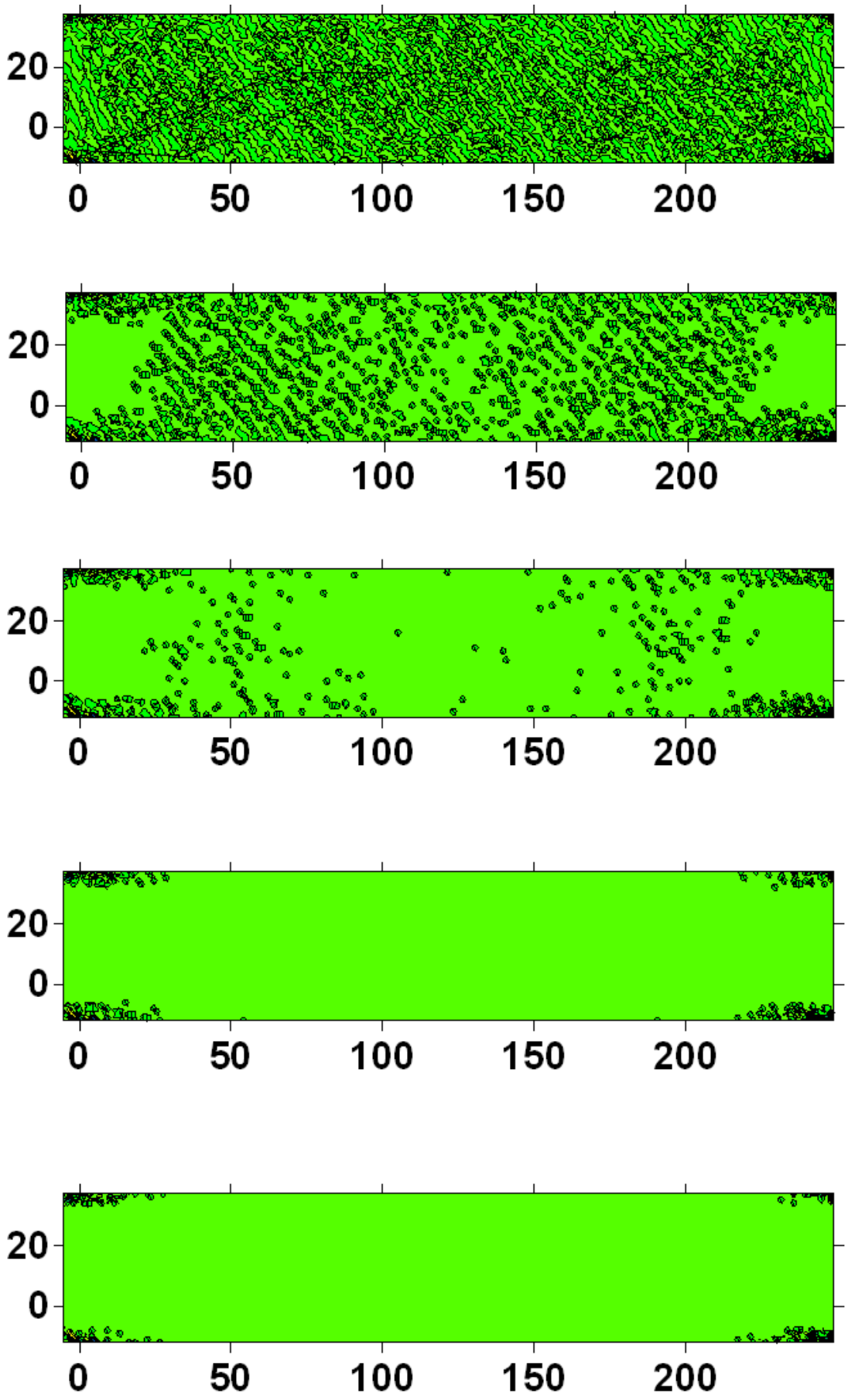
  C=IF(FABS(A)>.05,A,0)

  and provide a logical output file name (e.g., GridMath_thresh1.grd).

- USGSV/Grid Fourier Filtering/Step-by-Step/**Inverse Fourier Transform.** The masking file it asks for is just the original residual grid, it uses those dimensions to remove the extended cells. Provide a rational name for the output file (e.g. iFFT_thresh1.grd).




Residual
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30
135
110
85
60
35
10
-15
-40
-65
-90
-115
-140
Threshold = 0.1
105
90
75
60
45
30
15
0
-15
-30
-45
-60
Threshold = 0.2
75
60
45
30
15
0
-15
-30
-45
5
30
Threshold = 0.3
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
20



Fourier transforms of successive threshold cutoffs (0, 0.05, 0.1, 0.2, and 0.3)