2022-08-05 新设计毫米波雷达测角测试

【静态测试】

场景设置：毫米波雷达

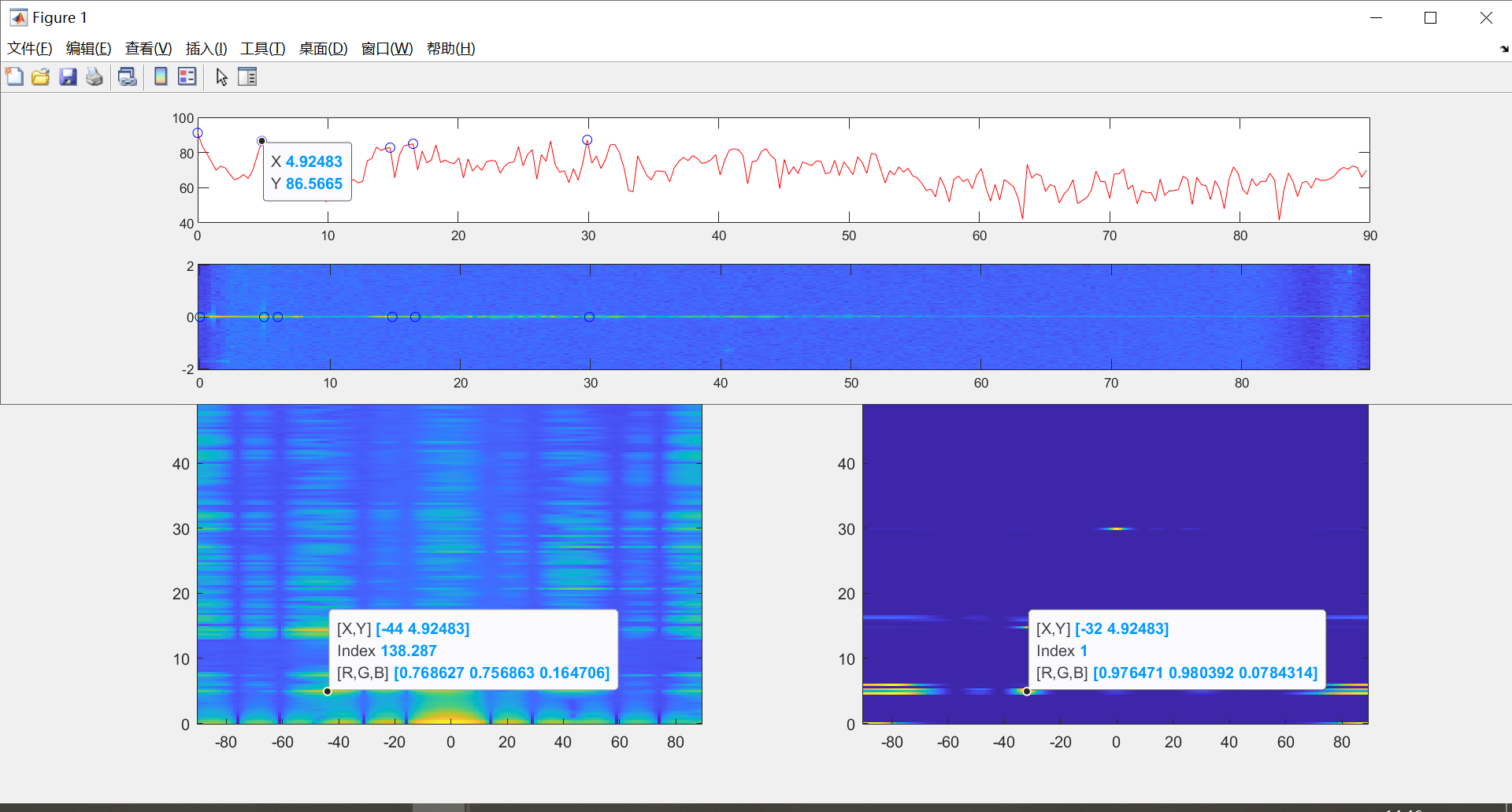
算法选取的参数：

Range cfar thresh = 0.25

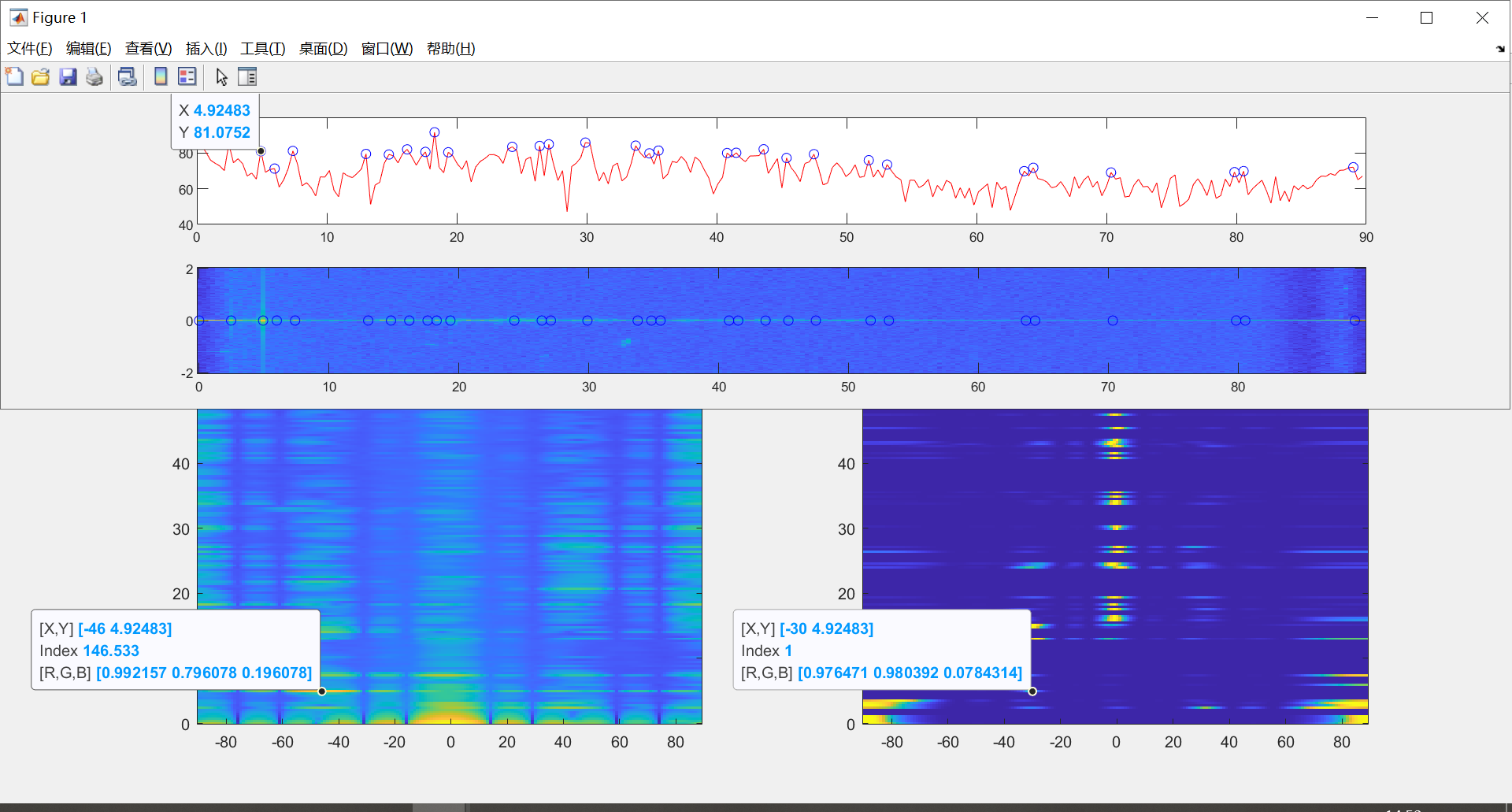
Doppler cfar thresh = 0.1

Frame = 4

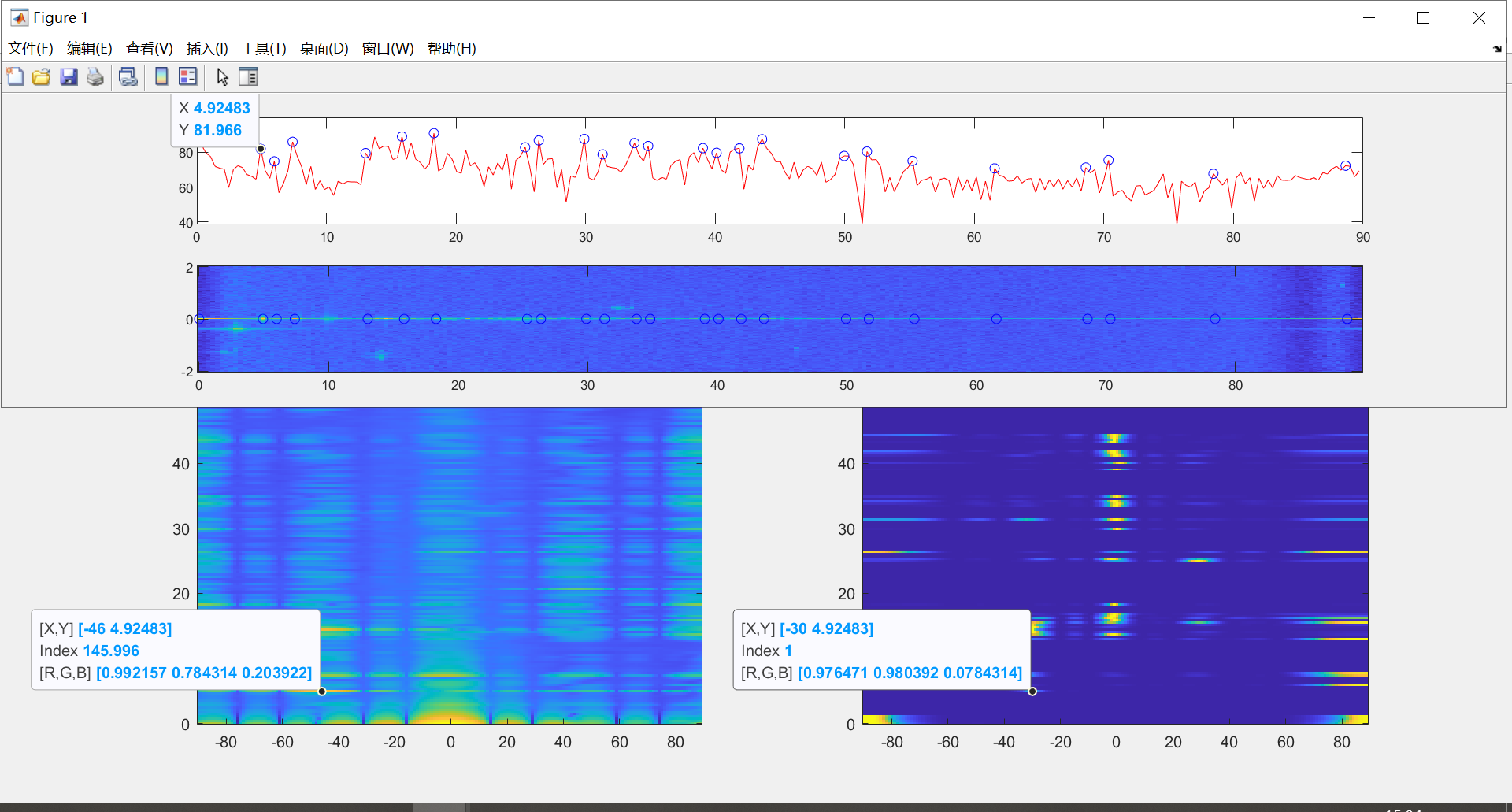
1. -45°下的结果



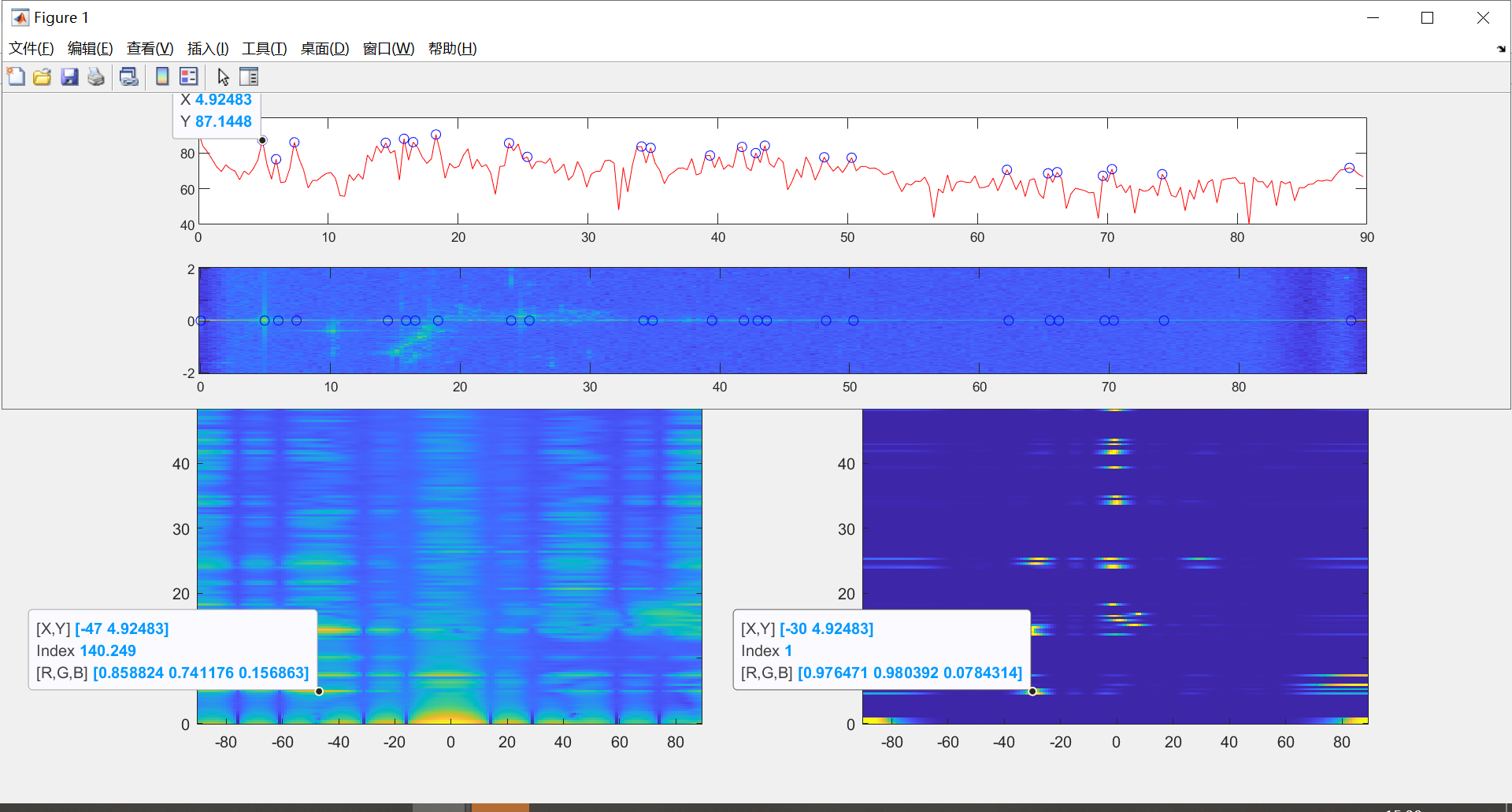
1. -30°



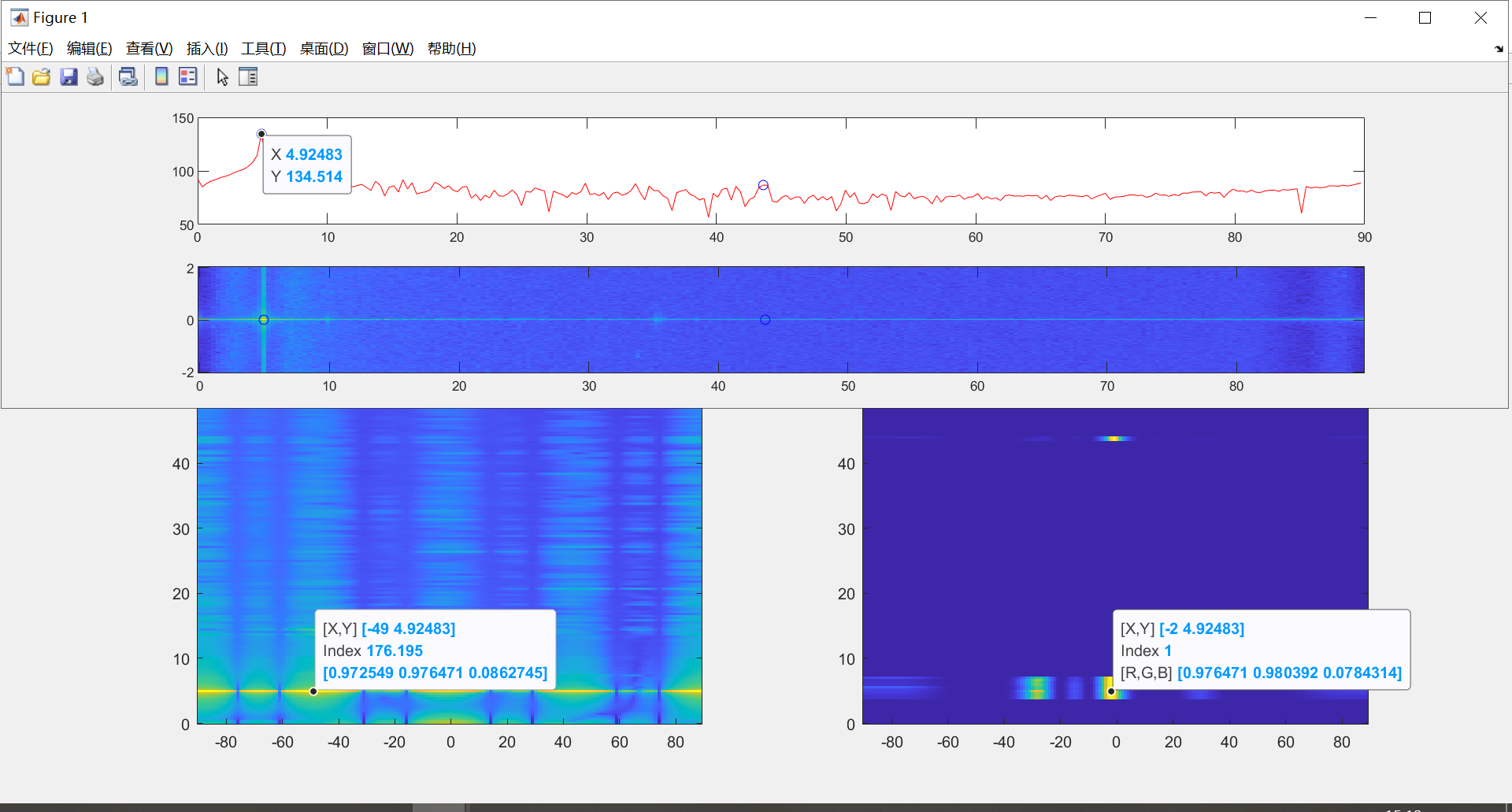
1. -25°



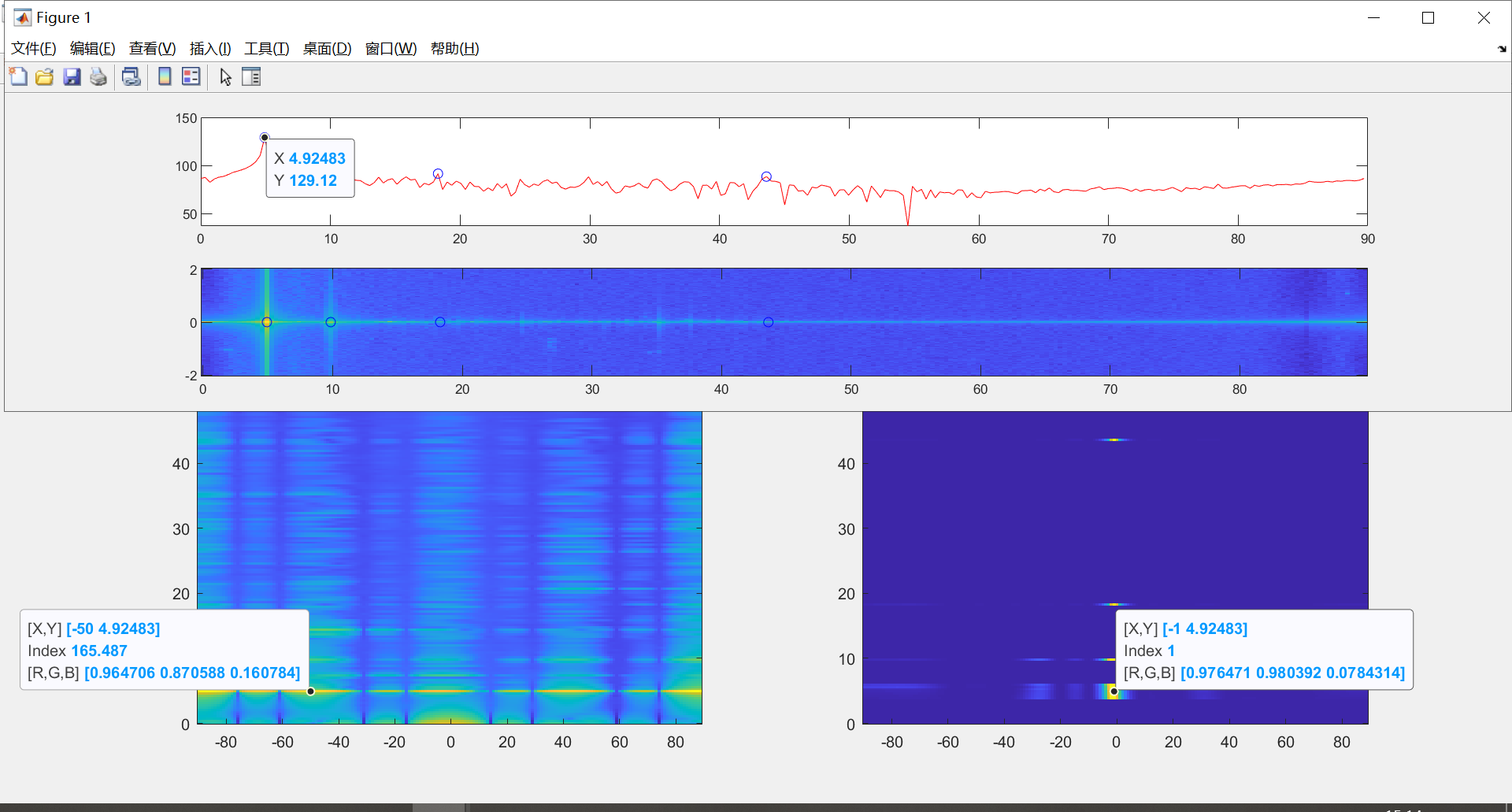
1. -20°



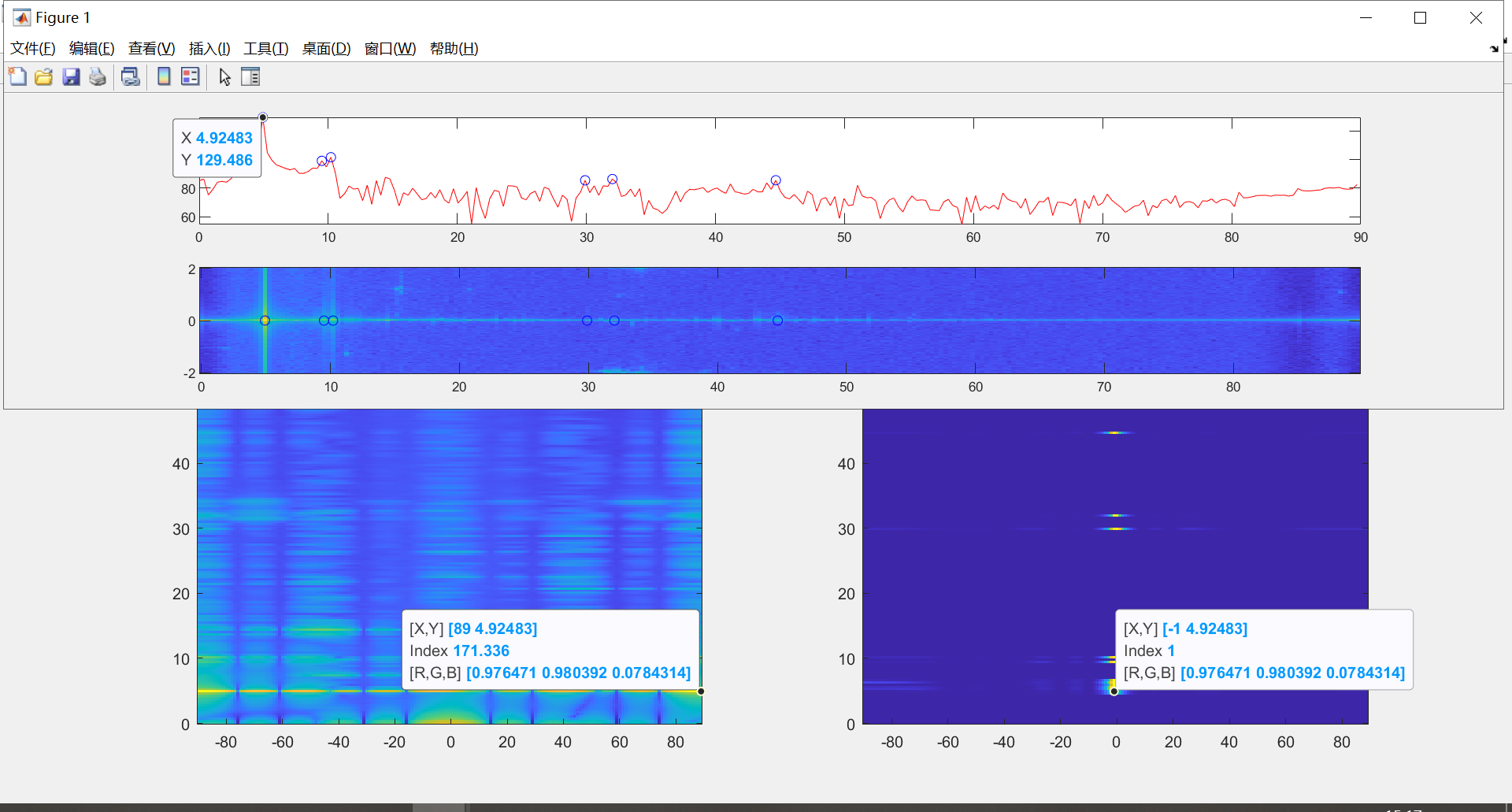
1. -15°



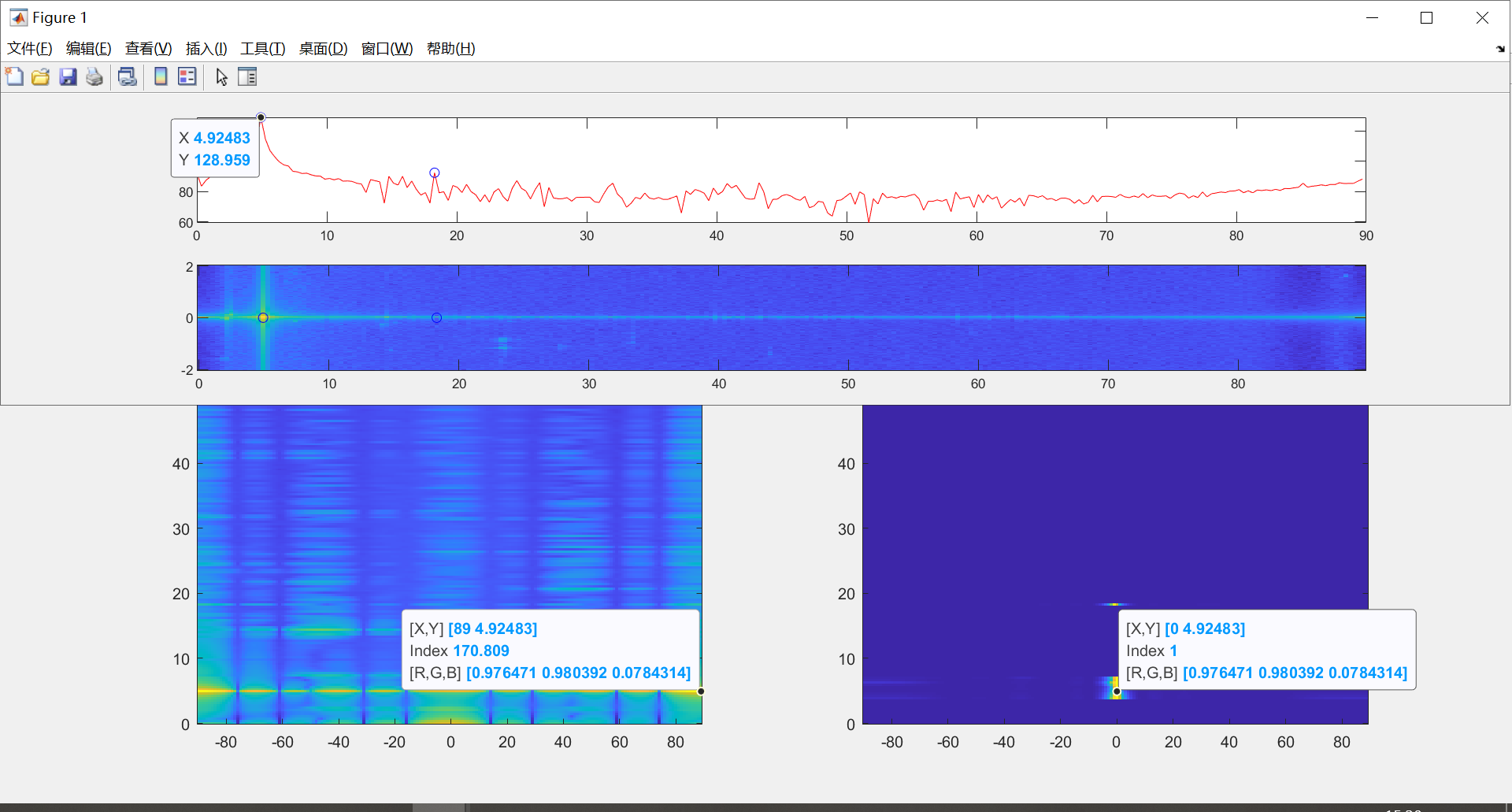
1. -10°



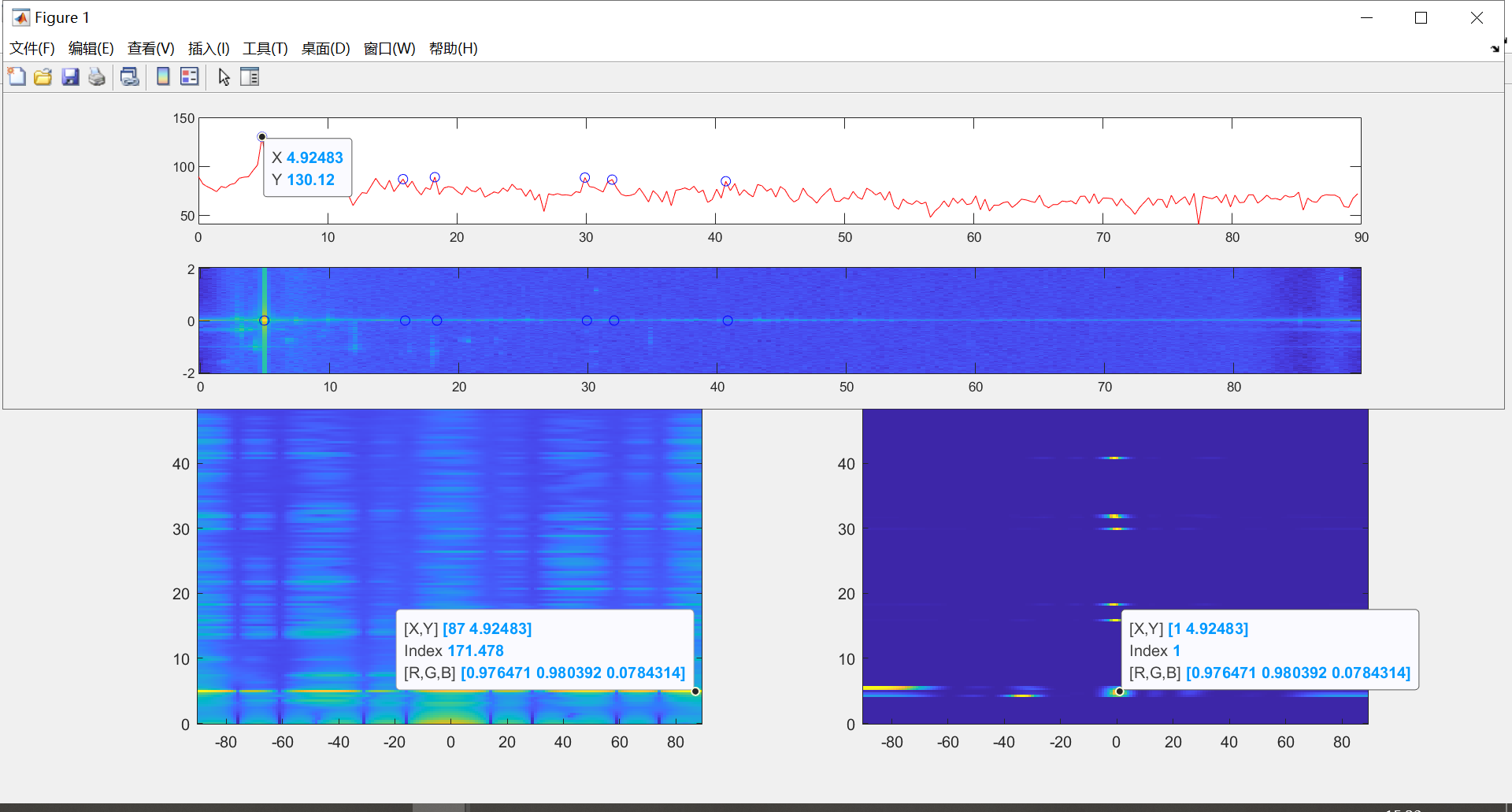
1. -5°



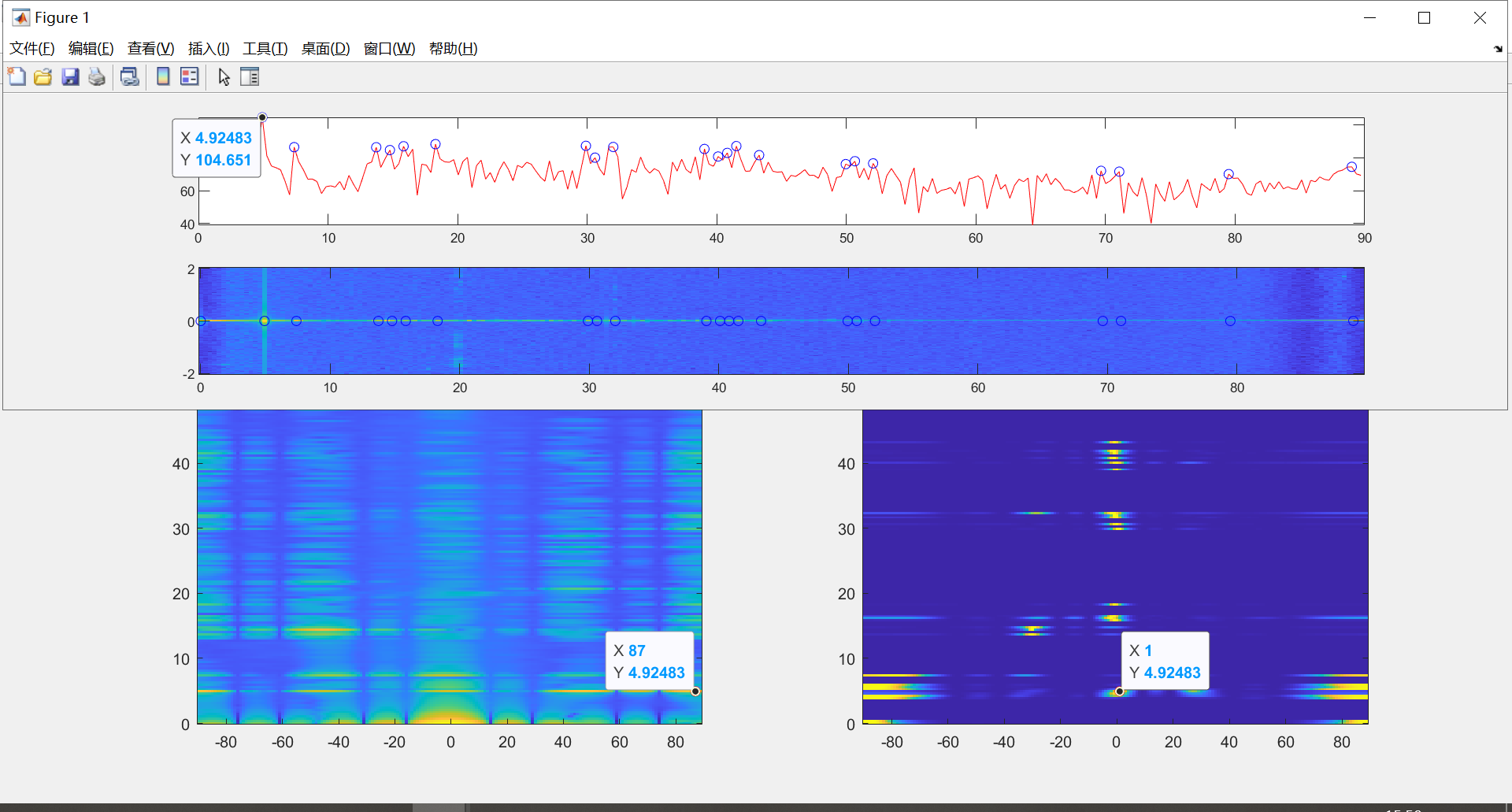
1. 5°



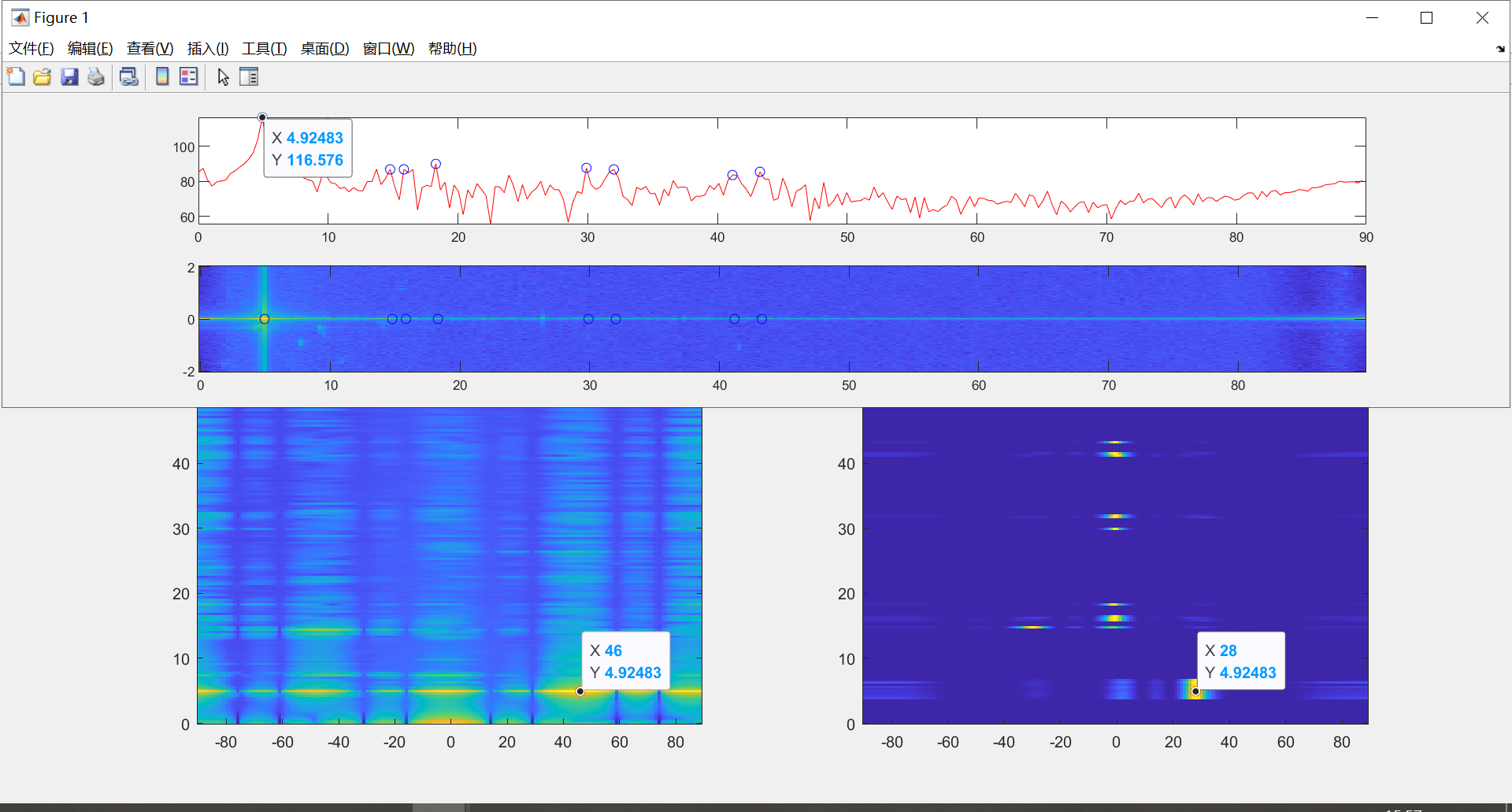
1. 10°



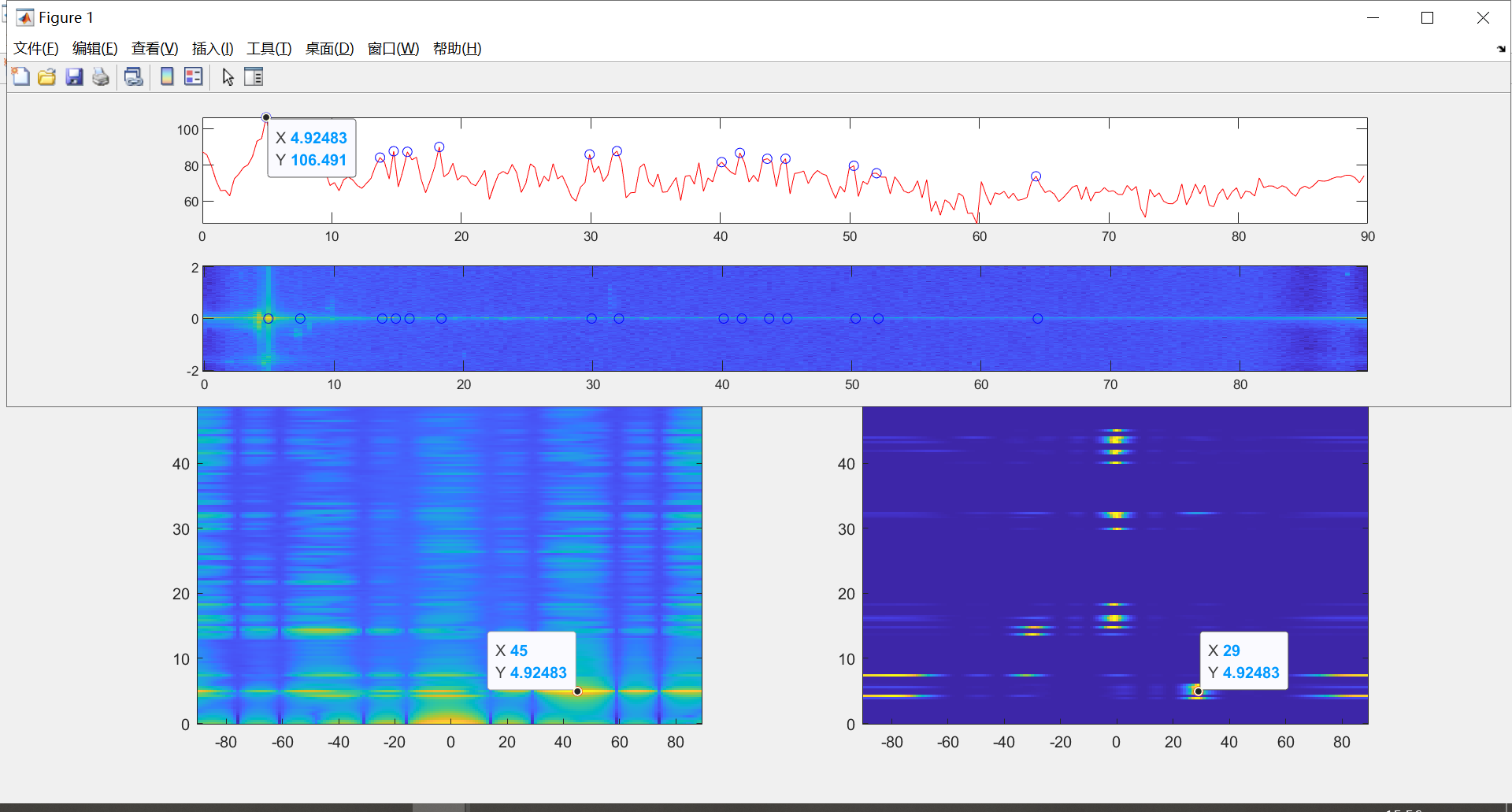
1. 15°



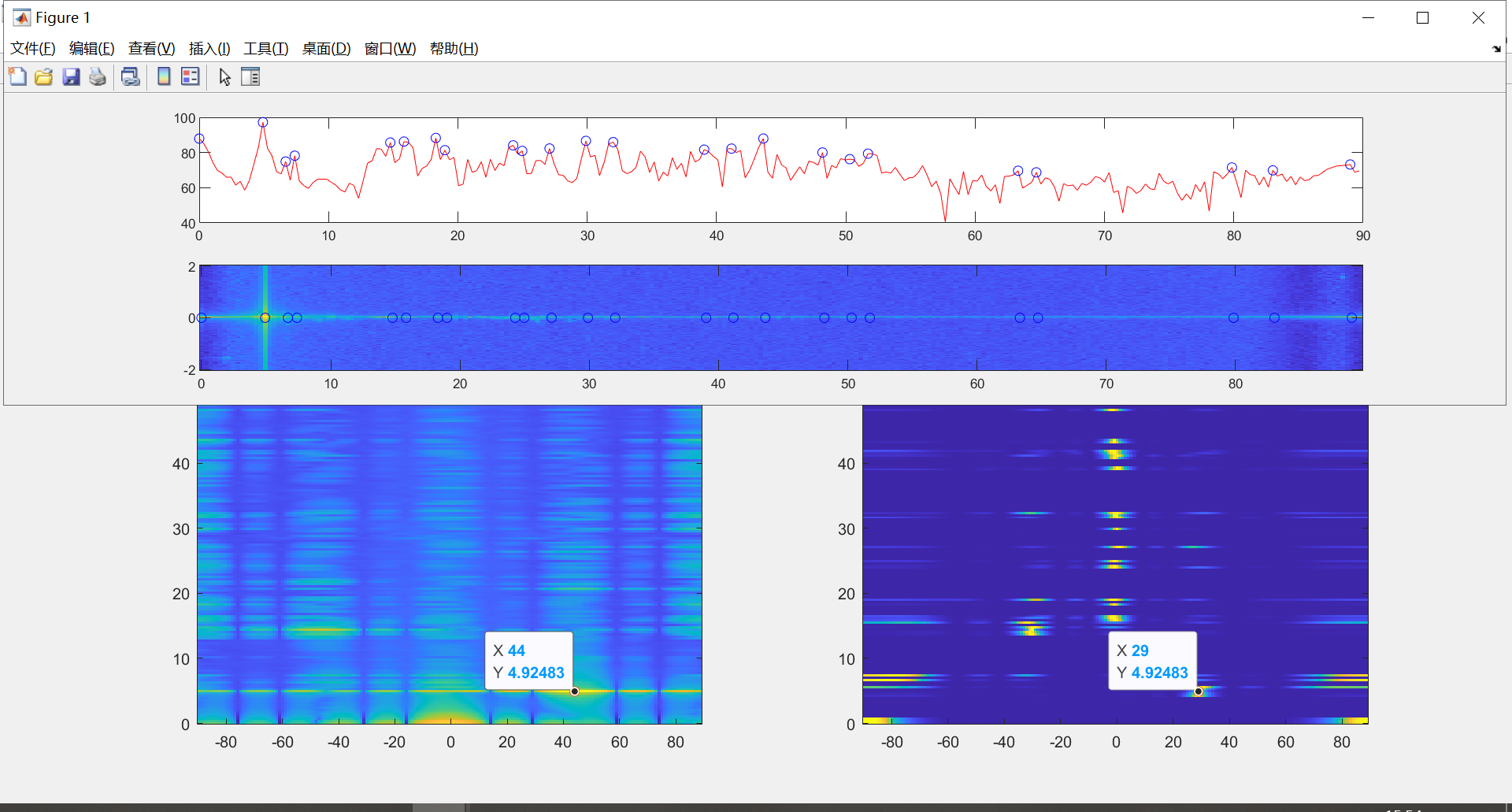
1. 20°



1. 25°

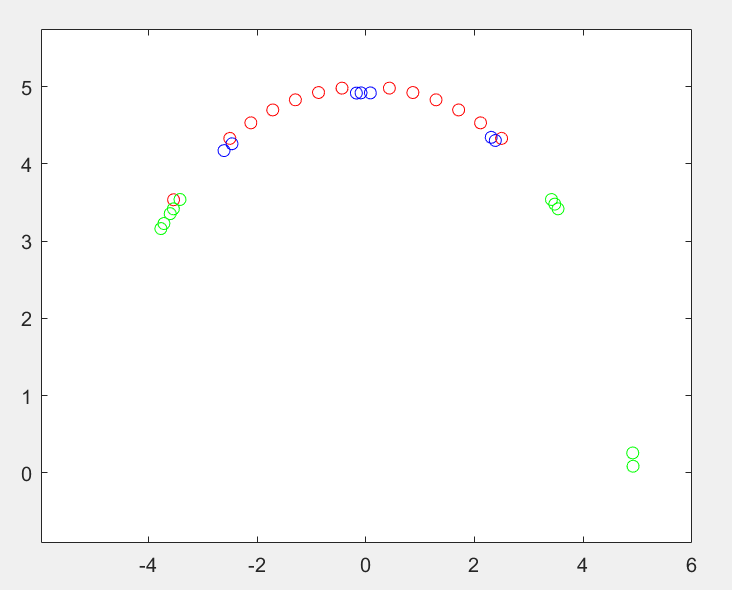


1. 30°

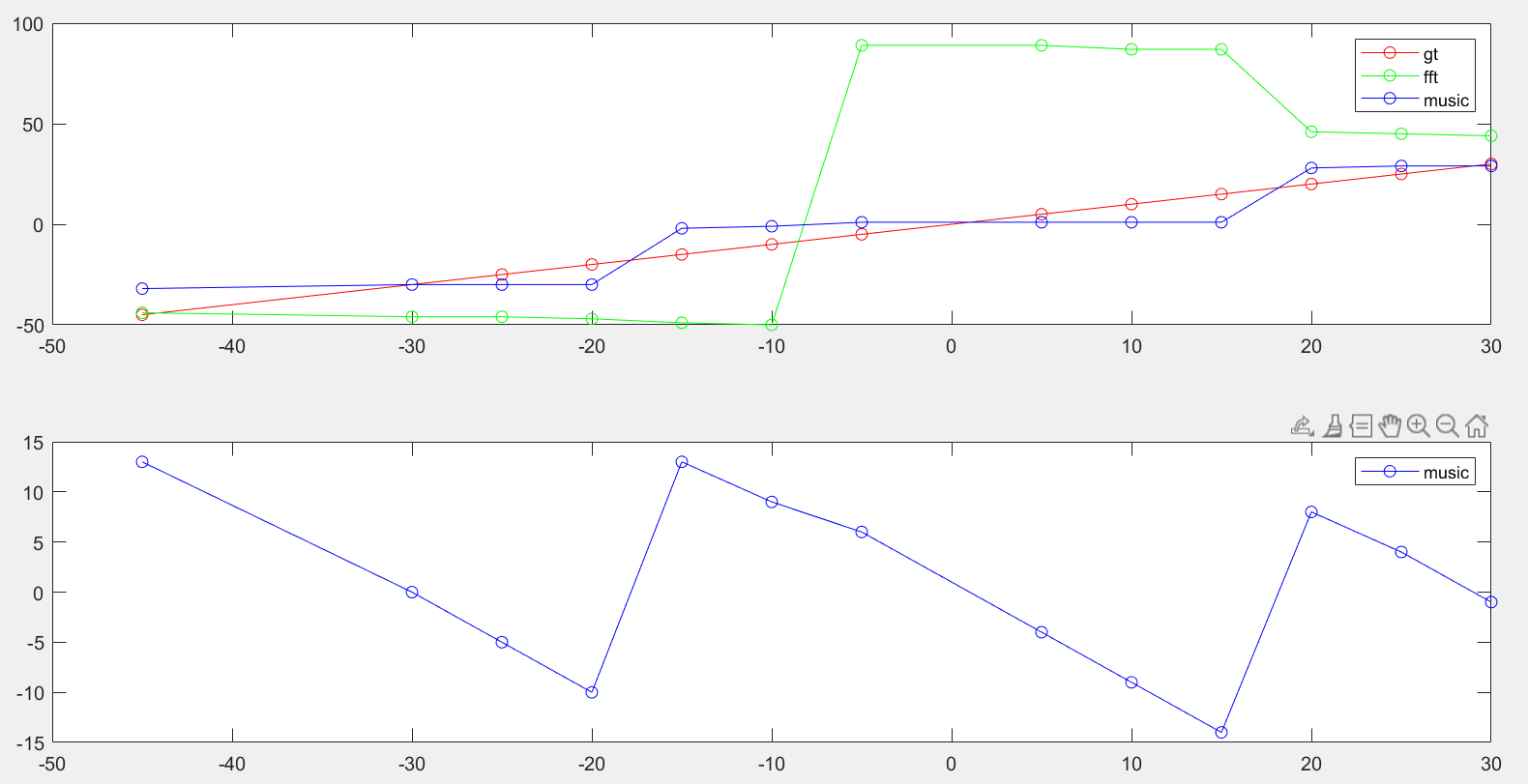


结果表格

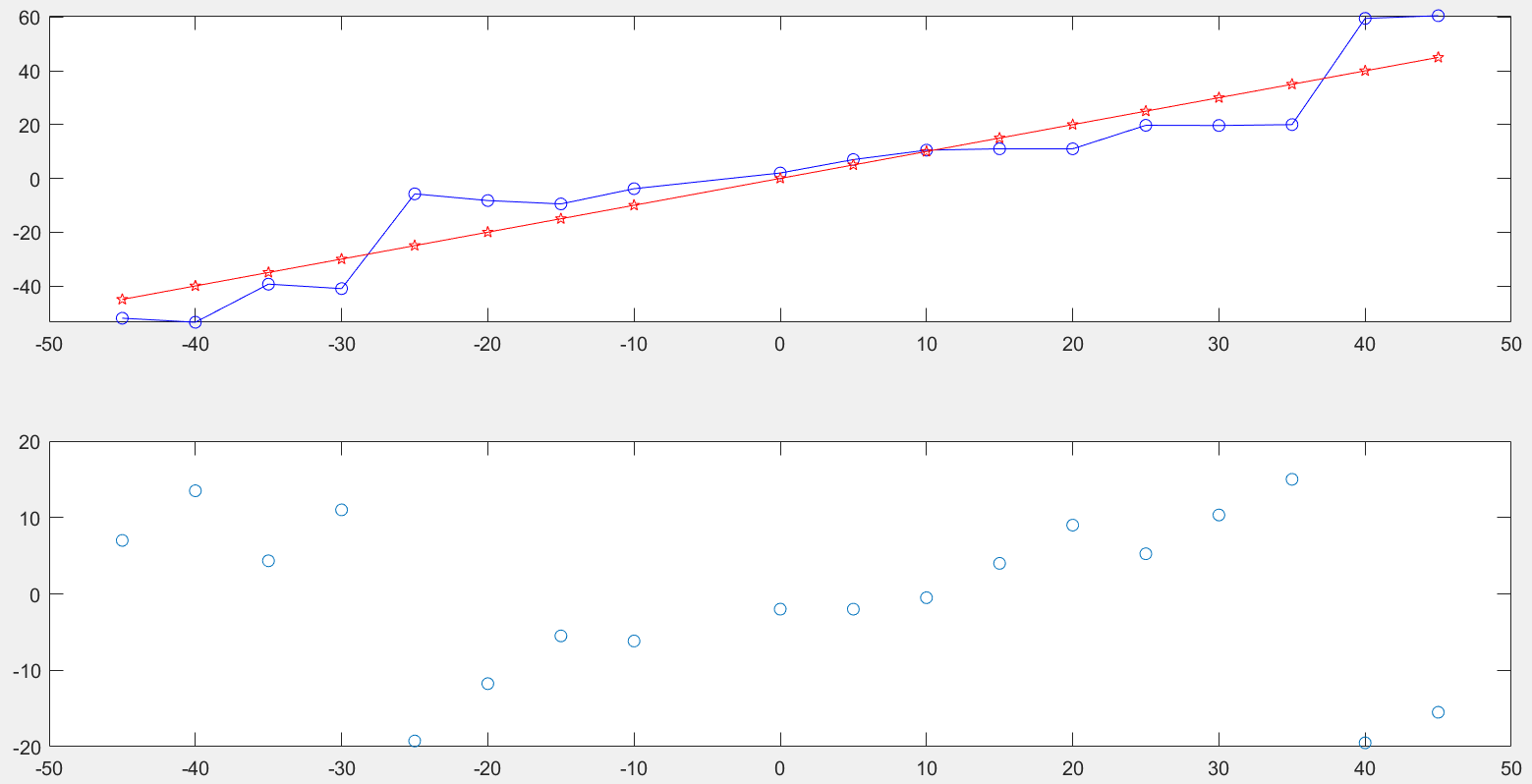
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Deg | -45 | -30 | -25 | -20 | -15 | -10 | -5 | 5 | 10 | 15 | 20 | 25 | 30 |
| FFT | -44 | -46 | -46 | -47 | -49 | -50 | 89 | 89 | 87 | 87 | 46 | 45 | 44 |
| Music | -32 | -30 | -30 | -30 | -2 | -1 | 1 | 1 | 1 | 1 | 28 | 29 | 29 |



误差曲线



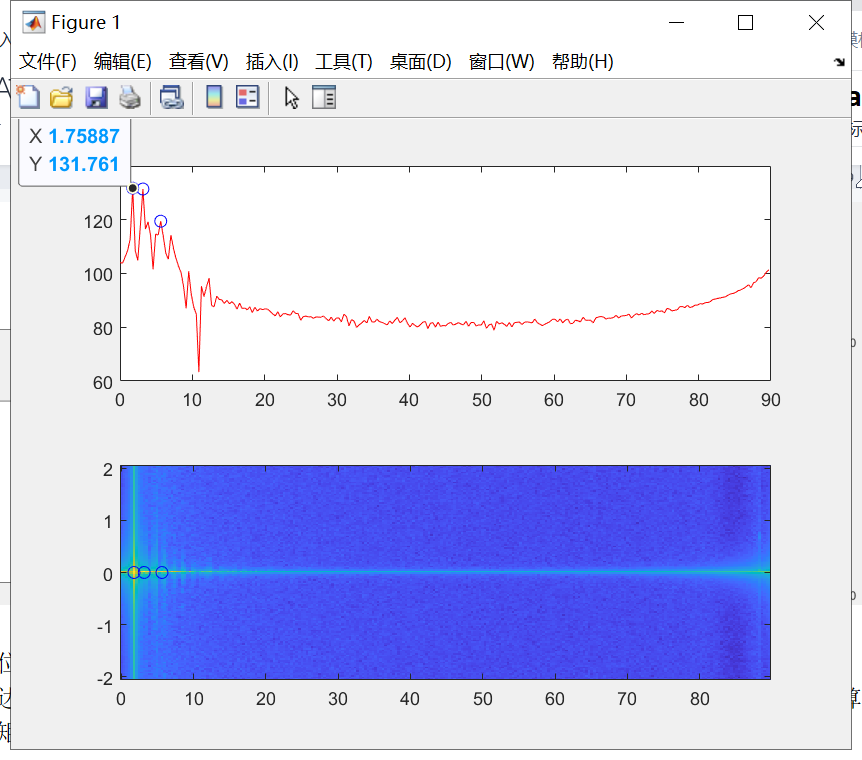
TI板子测角结果图误差曲线



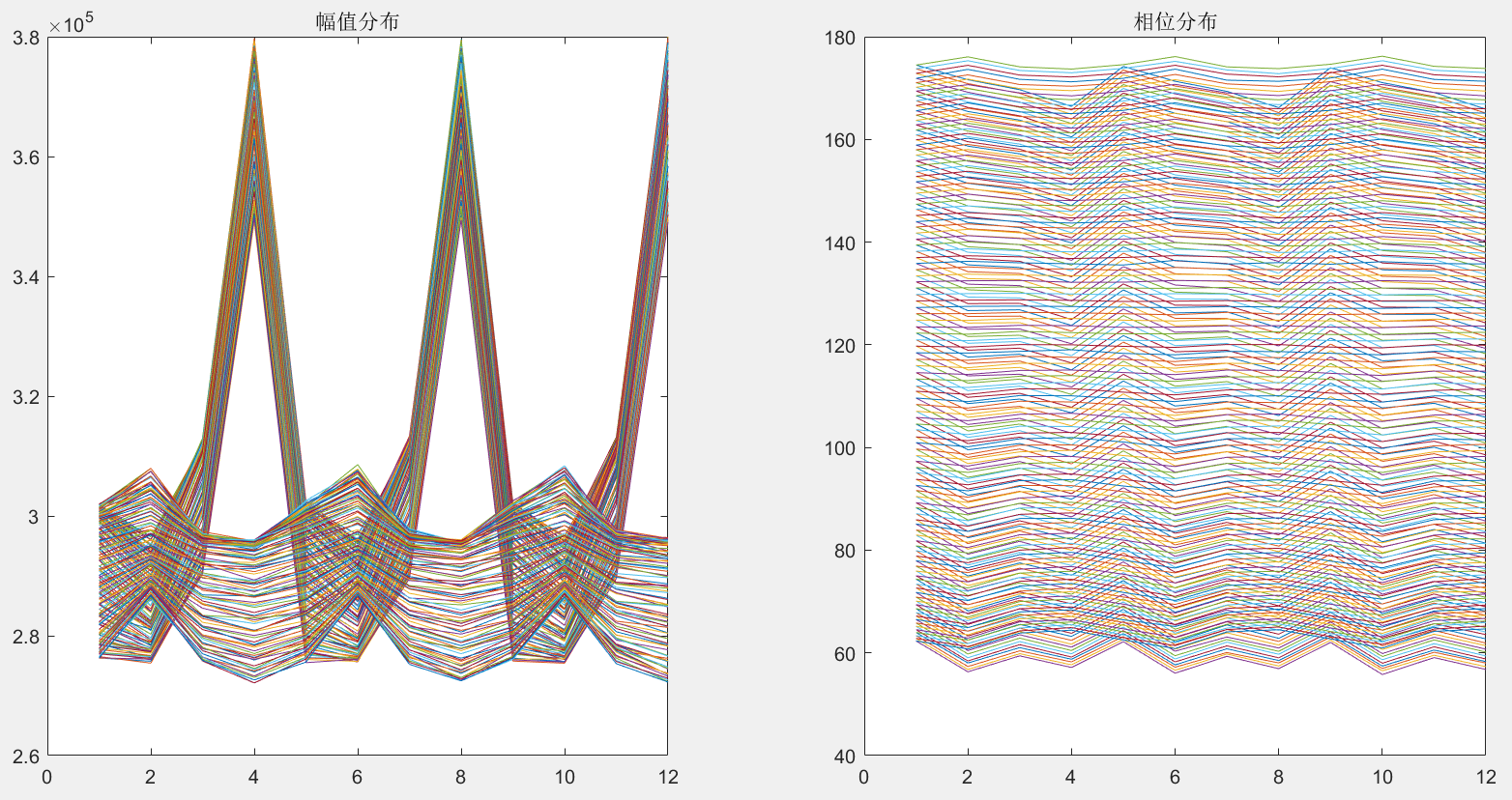
【相位校准】

在雷达正前方1.75m左右放置角反射器，配置雷达采集128chirp，对数据取平均后计算校正矩阵。得到的结果如下所示：

目标所处的位置



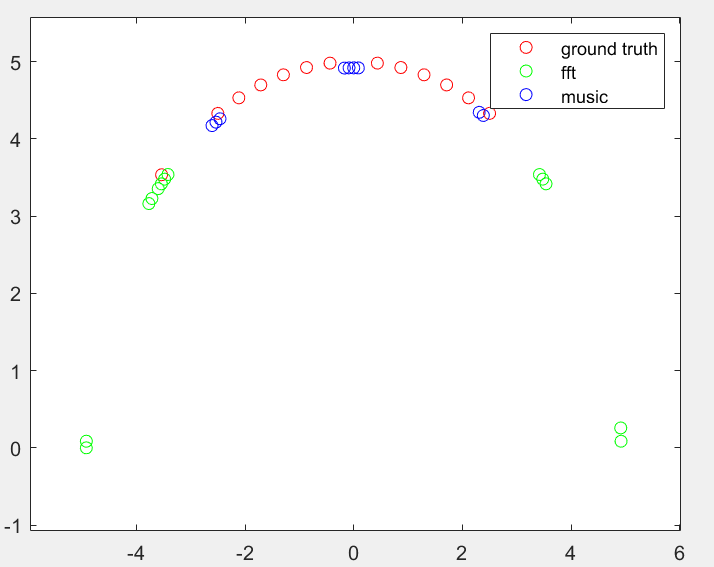
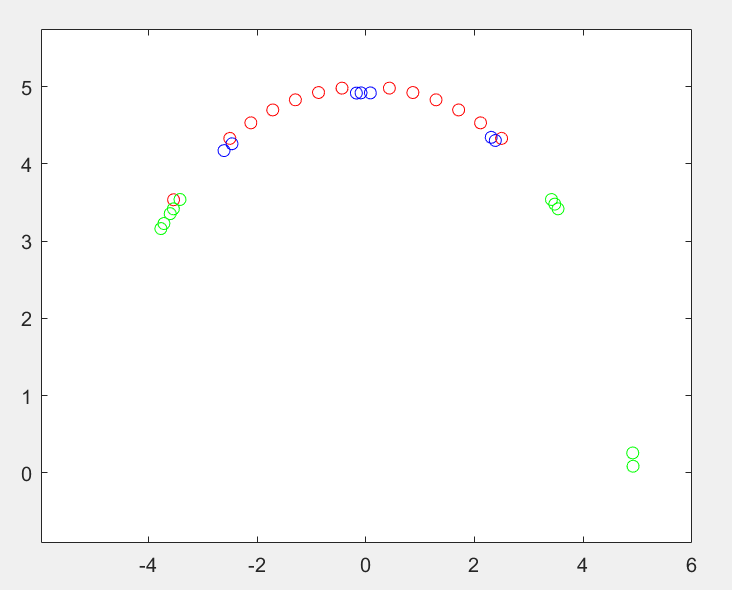
天线校准前后的对比结果，横轴是每个虚拟通道，0到12，纵轴是幅值和相位各自的值



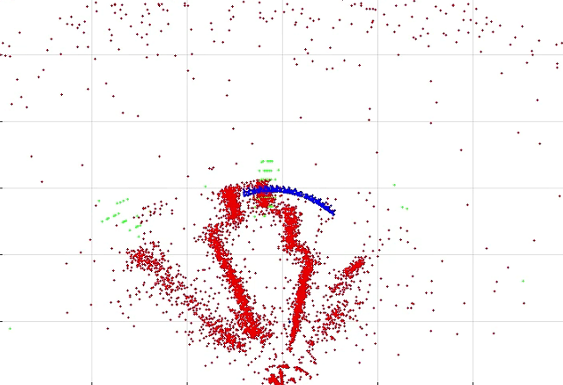
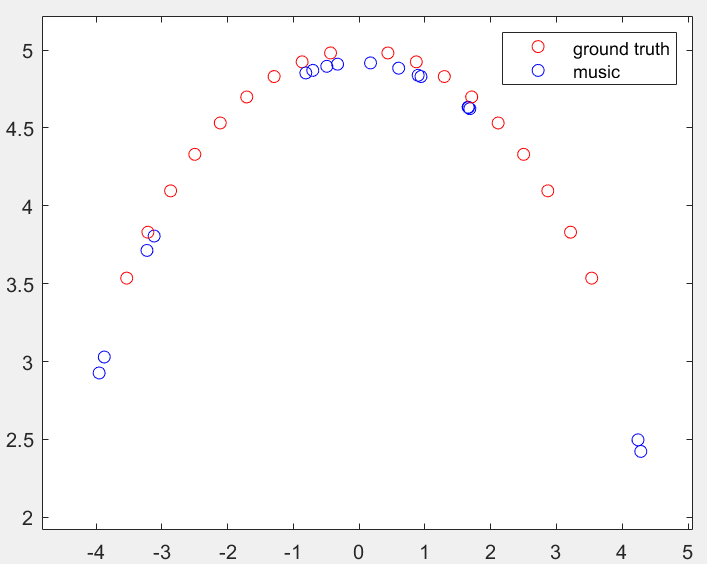
可以看到校准后相比校准前，幅值和相位的抖动是要更小的。可以尝试使用这样的数据来进行校准处理，看看效果。

结果表格

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| GtDeg | -45 | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 | 15 | 20 | 25 | 30 |
| FFT | -44 | -45 | -46 | -47 | -89 | -90 | -89 | 89 | 89 | 87 | 87 | 46 | 45 | 44 |
| Music | -32 | -31 | -30 | -30 | -2 | -1 | -1 | 0 | 0 | 1 | 1 | 28 | 29 | 29 |



新板子结果。左图，相位修正前，有图相位修正后



TI板子结果。左图，music结果，右图，动态目标轨迹点

【动态目标测量】

TI板子的动态目标测试结果