



HFSS far field to FEKO tool 使用说明



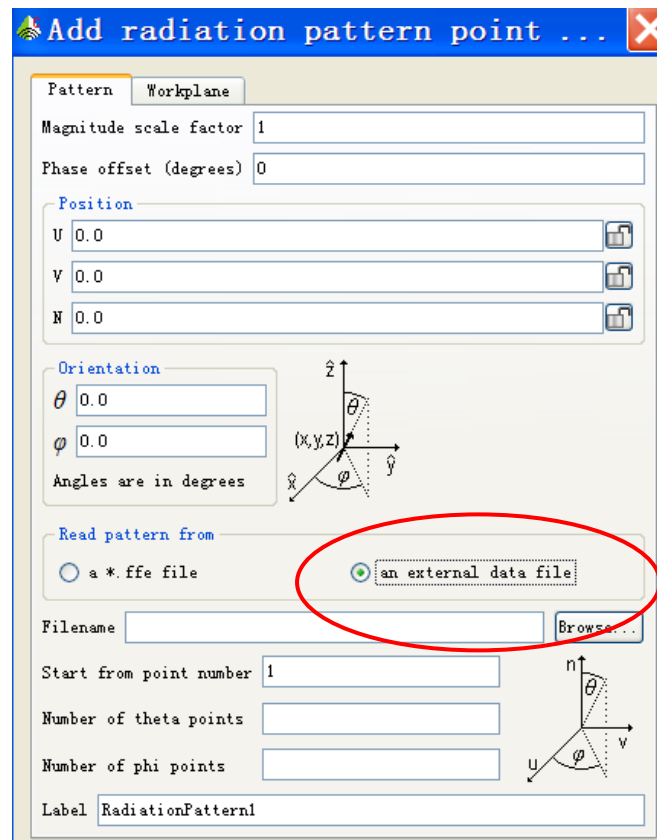
意义

- **HFSS**在很多单位尤其是天线设计单位使用广泛，很多天线数据是**HFSS**仿真得到的
- **FEKO**在天线布局上性能优越，但如果用**FEKO**重新仿真一次天线，重复计算
- 可利用该程序将**HFSS**仿真的结果，处理后导入到**FEKO**作为远场等效源激励，节省时间

FEKO中远场方向图数据格式

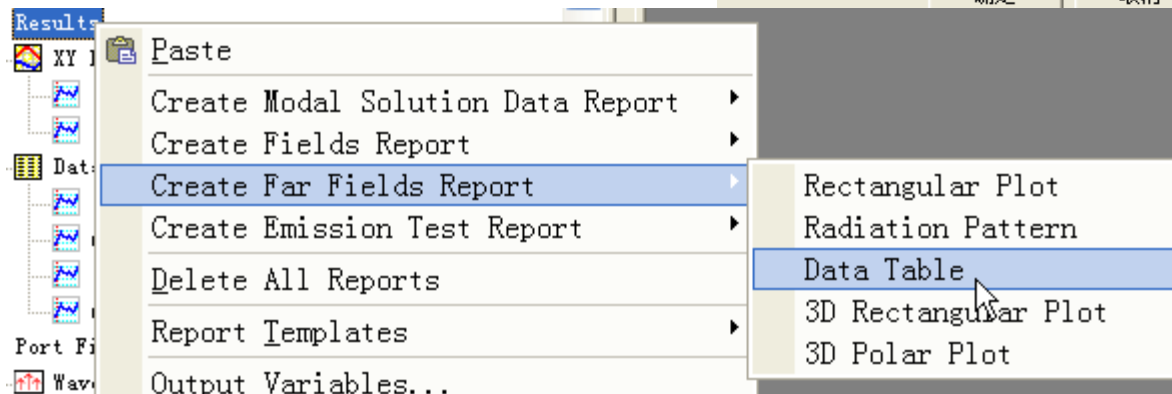
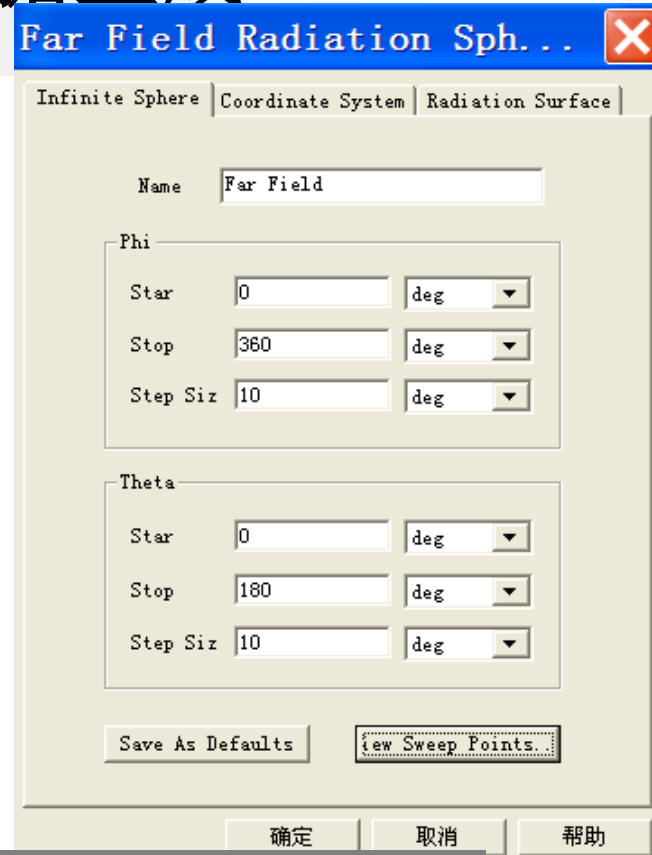
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- External data file 格式:
 - 每行用空格分隔的6列数据
 - Theta 角度
 - Phi 角度
 - E (theta) 的幅度单位为 V
 - E (theta) 的相位单位为deg
 - E (phi) 的幅度单位为 V
 - E (phi) 的相位单位为deg
 - Theta phi 每行的排列方法
 - Theta 1 phi1
 - Theta 2 phi1
 - Theta 3 phi1
 -
 - Theta 1 phi2
 - Theta 2 phi2
 - Theta 3 phi3
 -



HFSS far field 数据生成

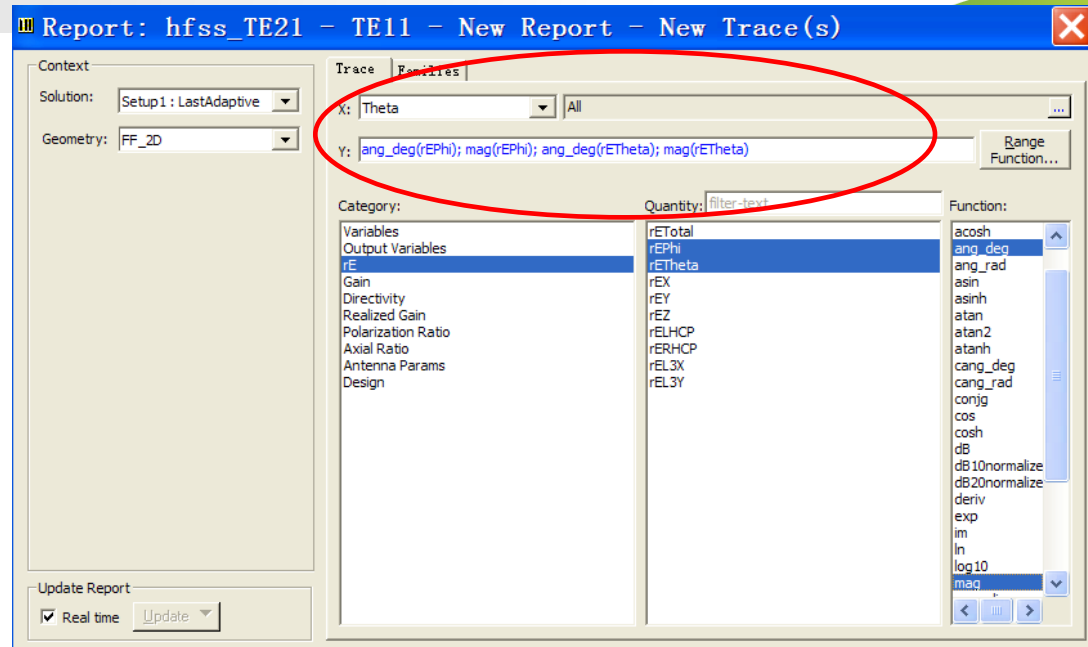
- 天线仿真好后，计算得到其3D远场电场结果，以表格形式显示，然后导出成txt文件
- 在HFSS中建立Radiation Sphere，如右图，参数设置中的step size在后面转换中 useful
- 然后在results里面建立report



HFSS 数据格式设定

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- 选择rE
- 第二列选择:
rEphi 及rEtheta
- 第三列选择:
ang_deg 及 mag
- New report



- 检查 Y 坐标是否为:
**ang_deg (rEphi) ; mag(rEphi); ang_deg (rEtheta) ;
mag(rEtheta);**

得到HFSS数据

- 该表包含了FEKO计算需要的所有数据信息，下一步就是导出成TXT格式便于后期处理

Theta [deg]	ang_deg(rEPhi) [deg] Freq=' 12.5GHz' Phi=' 0deg' Setup1 : LastAdaptive	ang_deg(rEPhi) [deg] Freq=' 12.5GHz' Phi=' 10deg' Setup1 : LastAdaptive	ang_deg(rEPhi) [deg] Freq=' 12.5GHz' Phi=' 20deg' Setup1 : LastAdaptive	ang_deg(rEPhi) [deg] Freq=' 12.5GHz' Phi=' 30deg' Setup1 : LastAdaptive
0.000000	-125.912465	-115.937749	-105.966498	-95.995247
10.000000	-156.028802	-146.055770	-136.083996	-126.102743
20.000000	115.296810	125.275758	135.248884	145.419916
30.000000	-28.188567	-18.171511	-8.161478	2.848484
40.000000	138.973015	149.292199	159.736208	169.980916
50.000000	-95.304844	-83.917634	-71.900170	-60.591250
60.000000	42.781328	52.884200	60.591250	71.900170
70.000000	139.117387	145.755273	151.157087	161.987731

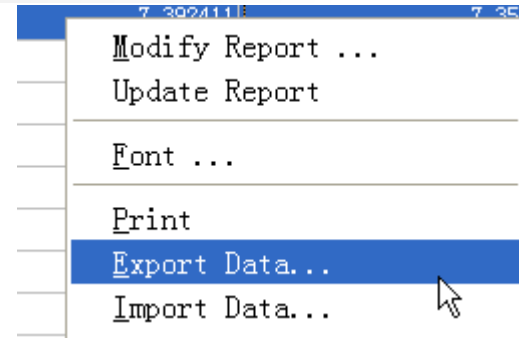
Theta [deg]	mag(rEPhi) [V] Freq=' 12.5GHz' Phi=' 0deg' Setup1 : LastAdaptive	mag(rEPhi) [V] Freq=' 12.5GHz' Phi=' 10deg' Setup1 : LastAdaptive
-125.912465	41.586979	41.586979
-156.028802	37.304844	37.304844
115.296810	26.848484	26.848484
-28.188567	15.614781	15.614781
138.973015	7.362080	7.362080
-95.304844	2.848484	2.848484
42.781328	0.614781	0.614781
139.117387	0.912500	0.912500
161.987731	0.816148	0.816148
172.578695	0.591250	0.591250
-176.352260	0.419916	0.419916
-167.465662	0.419916	0.419916
-150.256508	0.304844	0.304844
-133.749439	0.248884	0.248884
-24.098758	0.419916	0.419916
140.259528	0.614781	0.614781

- 确定mag (rphi) 及mag (rtheta) 的单位为V
- 如某些列为mv，则会导致错误

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导出in.txt

- 表内点击右键，Export to file
- 选择路径，输入文件名，建议取名为in.txt
- 用写字板打开文件in.txt
- 通过查找mV，检查单位是否为V



in.txt - 写字板

文件(F) 编辑(E) 查看(V) 插入(I) 格式(O) 帮助(H)

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Data Table 2 15:13:00

Theta [deg]	ang_deg(rEPhi) [deg] Freq=' 12.5GHz' Phi=' 0deg'	ang_deg(rEPhi) [deg] Freq=' 12.5GHz' Phi=' 10deg'	ang_deg(rEPhi) [deg] Freq=' 12.5GHz' Phi=' 20deg'
0.0000000000000000	-125.912464754615970	-115.937749471047440	-105.966498322612670
10.0000000000000000	-156.028801507534380	-146.055770003002460	-136.083996226499640
20.0000000000000000	115.296809793775440	125.275758380056830	135.248884284109860
29.9999999999999996	-28.188567392979056	-18.171511288136223	-8.161477900279730
40.0000000000000000	138.973014832742850	149.292199173306700	159.736208412056210
50.0000000000000000	-95.304843958305923	-83.917633621137341	-71.900169903352193
59.9999999999999993	42.781327623630773	52.884200100032203	60.591250242247852
70.0000000000000000	139.117387316090630	145.755273258506630	151.157086637185130
80.0000000000000000	161.987730814028230	170.414830965446950	-176.767382442219630
90.0000000000000000	172.578695458931800	-174.605950300503910	-151.398413435228780



编辑in.txt (写字板打开格式清晰)

- 用写字板编辑将in.txt文件的前面文本行全部删除
- 添加一行数据，格式如下
- theta_step theta_n phi_step phi_n
- 如10 19 10 37意思是：theta每隔10度取点，共19个点，phi每隔10度取点，共37个点



```
in.txt - 写字板
文件(F) 编辑(E) 查看(V) 插入(I) 格式(O) 帮助(H)
0.0000000000000000 -125.912464754615970 -115.937749471047440 -105.9
10.0000000000000000 -156.028801507534380 -146.055770003002460 -136.0
20.0000000000000000 115.296809793775440 125.275758380056830 135.2
29.9999999999999996 -28.188567392979056 -18.171511288136223 -8.1
40.0000000000000000 138.973014832742850 149.292199173306700 159.7
50.0000000000000000 -95.304843958305923 -83.917633621137341 -71.9
59.9999999999999993 42.781327623630773 52.884200100032203 60.9
70.0000000000000000 139.117387316090630 145.755273258506630 151.1
80.0000000000000000 161.987730814028230 170.414830965446950 -176.7
90.0000000000000000 172.578695458931800 -174.605950300503910 -151.3
100.0000000000000000 -176.352259694020830 -161.147171615744040 -143.9
```



运行数据转换程序

HFSSField2FEKO.exe

- 将in.txt拷入HFSSField2FEKO.exe文件所在目录，运行提示成功，则目录下会生成out.txt文件供FEKO调用

HFSS 导出天线远场数据后，经该程序转换成FEKO的AR卡能导入的输入文件
请先阅读使用说明

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+++++文件转换成功!

out.txt - 记事本				
文件(F)	编辑(E)	格式(O)	查看(V)	帮助(H)
0	0		41.4935	143.97917389078
10	0		37.299018029708	114.61184857603
20	0		27.3568881607	28.081180139745
30	0		16.803317849831	-112.38978302733
40	0		8.8410338922105	57.957615429666
50	0		4.0171312334047	-173.16542713378
60	0		1.7477460472505	-71.801147940479
70	0		0.96161471105534	3.5710164430793
80	0		0.59063101292123	48.414620486719
90	0		0.39031884082551	81.566545507436
100	0		0.3440888245681	100.2159184383

导入FEKO

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- CADFEKO中选择Add radiation pattern point source, 输入相关参数
- 选择an external data file
- Theta points和phi points就是in.txt文件需要输入的点数
- FEKO中其他计算相同

