

十四：更具挑战性的优化

SYNOPSYS光学设计软件

设置工作目录

- 选择**Dbook-II** 工作目录



参考Donald Dilworth 《Lens Design(Second Edition) Automatic and quasi-autonomous computational methods and techniques》第7章

这里是镜头文件：

```
RLE                !启动系统
ID TEST PSD III
OBB 0 20 12.7
WAVL CDF
UNITS MM
1 TH 5 GLM 1.6 50 2 TH 5
3 TH 5 GLM 1.6 50 4 TH 5
5 TH 5 GLM 1.6 50 6 TH 5
7 TH 5 GLM 1.6 50
8 TH 5
9 TH 5 GLM 1.6 50
10 TH 5
11 TH 5 GLM 1.6 50
12 TH 5
13 TH 5 GLM 1.6 50
14 TH 50
15
APS 7
END
PAD/U             !显示初始系统.
PROJE CT          !启动一个计时器，然后为光圈重量定义一个符号，AWT
AWT: 0.5           !几乎等同于光圈的重量
QUIET             !不在显示器上显示所有内容会加速事情的进展
PANT              !定义变量.
CUL 1.9           !在指数变量上设定上限为1.9.
FUL 1.9
VY 1 YP1          !变化同轴心的停止位置.
VLIST RAD 1 2 3 4 5 6 7 8 9 10 11 12 13 14
VLIST TH ALL
VLIST GLM ALL
END
```

```
AANT
AEC
ACC
M 33 2 A GIHT
GSR AWT 5 5 M 0
GNR AWT 4 4 M .3
GNR AWT 4 4 M .6
GNR AWT 5 4 M .75
GNR AWT 4 4 M .8
GNR AWT 4 4 M 1
END
SNAP 100
DAMP 1000
SYNOPSIS 5
SYNOPSIS 10
SYNOPSIS 15
SYNOPSIS 100
ANNEAL 50 10
LOUD
MERIT?
STORE 3
ARGLASS 3 QUIET
CAT S
INCLUDE 1 TO 13
PREF
SAFE
GO
PROJECT
MOF M 0 40 80 0 Q 30 20 10
```

! 定义优化函数的开始.

! 注意如何给几个场点分配权重.

! 这将在0.3视场点创建一个光线网格

! 这将在0.6视场点创建一个光线网格

! 这将在0.75视场点创建一个光线网格

! 这将在0.8视场点创建一个光线网格

! 这将在1视场点创建一个光线网格

! 恢复对监视器的输出

! 将结果存储在库中.

! ARGLASS输入的开始.

! 指定肖特玻璃目录.

! 做到所有表面.

! 只使用首选的玻璃类型

! 环境安全的玻璃。.

! 执行ARGLASS.

! 查看这项工作花了多长时间

! 计算场上的MTF.

- 作业运行约30秒，并产生此结果：

RLE

ID TEST PSD III

180

WAVL .6562700 .5875600 .4861300

APS 1

UNITS MM

OBB 0.000000 20.00000 12.70000 -25.39490 0.00000

0.00000 12.70000 0 AIR

1 RAD 63.9324304819396 TH 6.13775631

1 N1 1.82743442 N2 1.83402633 N3 1.84979432

1 CTE 0.584000E-05

1 GTB S 'N-LASF40 '

2 RAD 121.4260973202004 TH 1.00000000 AIR

3 RAD 38.9734739086511 TH 20.57680176

3 N1 1.72508287 N2 1.72915286 N3 1.73846093

3 CTE 0.581000E-05

3 GTB S 'N-LAK34 '

4 RAD 87.2688769717594 TH 1.01574402 AIR

5 RAD 76.7614323395048 TH 3.26054685

5 N1 1.72090550 N2 1.72827542 N3 1.74642643

5 CTE 0.940000E-05

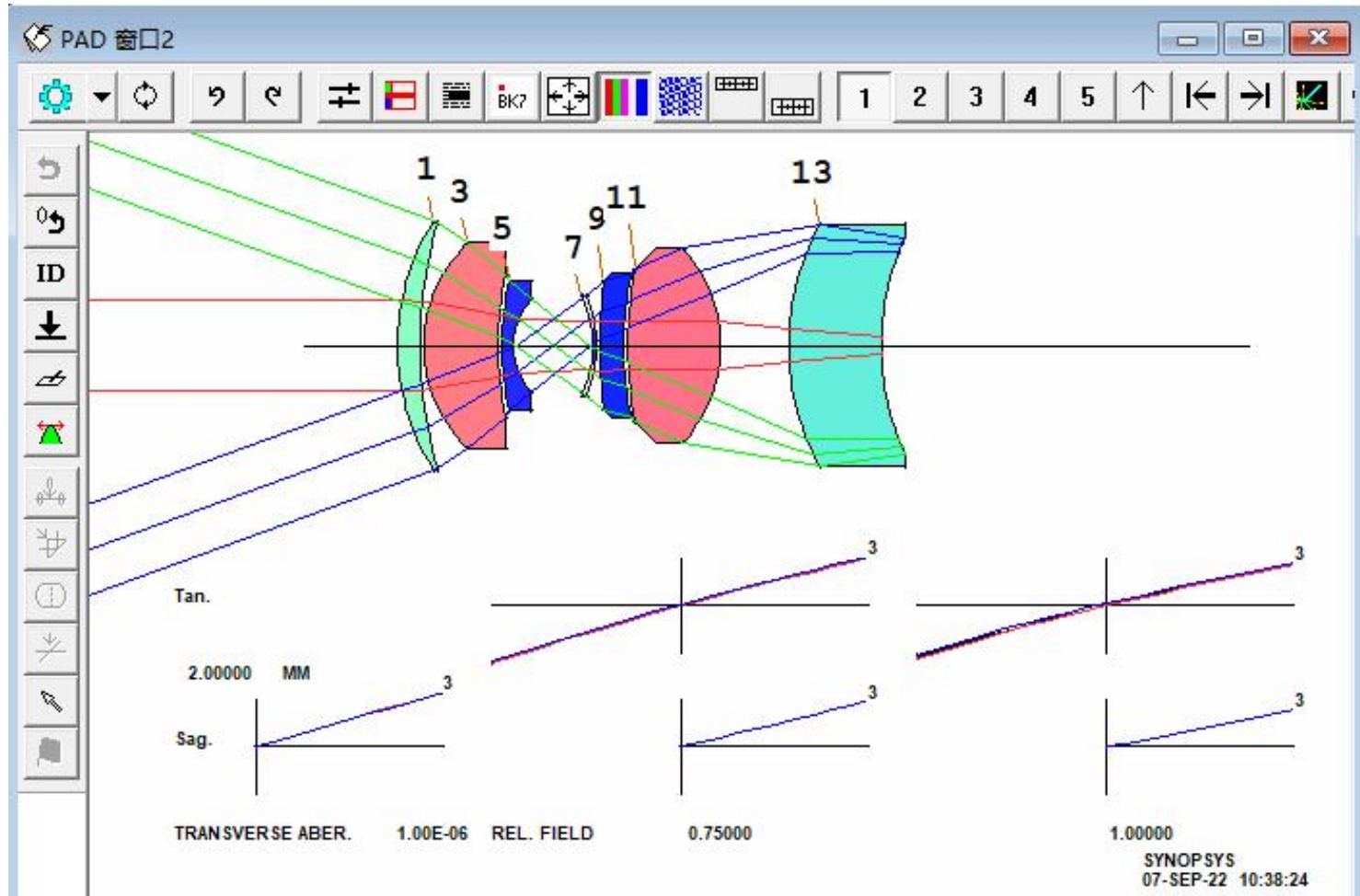
5 GTB S 'N-SF10 '

```

6      RAD      19.7361513224512    TH      21.84758786 AIR
7      RAD      -29.7587962681538    TH      1.00000000
7 N1 1.83649445 N2 1.84665729 N3 1.87209365
7 CTE 0.846000E-05
7      GTB S      'N-SF57            '
8      RAD      -38.0771643426431    TH      1.00000000 AIR
9      RAD      148.7057065172241    TH      6.45696908
9 N1 1.91038602 N2 1.92285755 N3 1.95457944
9 CTE 0.590000E-05
9      GTB S      'N-SF66            '
10     RAD      84.7349933920333    TH      1.28380951 AIR
11     RAD      116.5460118813826    TH      25.45671730
11 N1 1.64820928 N2 1.65159874 N3 1.65934342
11 CTE 0.710000E-05
11     GTB S      'N-LAK7            '
12     RAD      -40.6054550188090    TH      18.94463076 AIR
13     RAD      70.2471757058936    TH      25.49467569
13 N1 1.84254602 N2 1.85024035 N3 1.86897227
13 CTE 0.737000E-05
13     GTB S      'N-LASF9            '
14     RAD      73.0342740343945    TH      16.56312158 AIR
15     CV        0.000000000000000    TH      0.00000000 AIR
END
  
```

二维图

- 点击运行按钮 



全视场衍射MTF

点击像质分析->MTF(衍射)->全视场MTF,颜色选项输入M, 点击运行 MOF, 生成MTF图

全视场衍射MTF

命令 | 绘图 | 数据

颜色: (颜色编号 (ICOL) 1 - 3, P, or M) 波长: 微米

频率 (FREQ): 线对/毫米

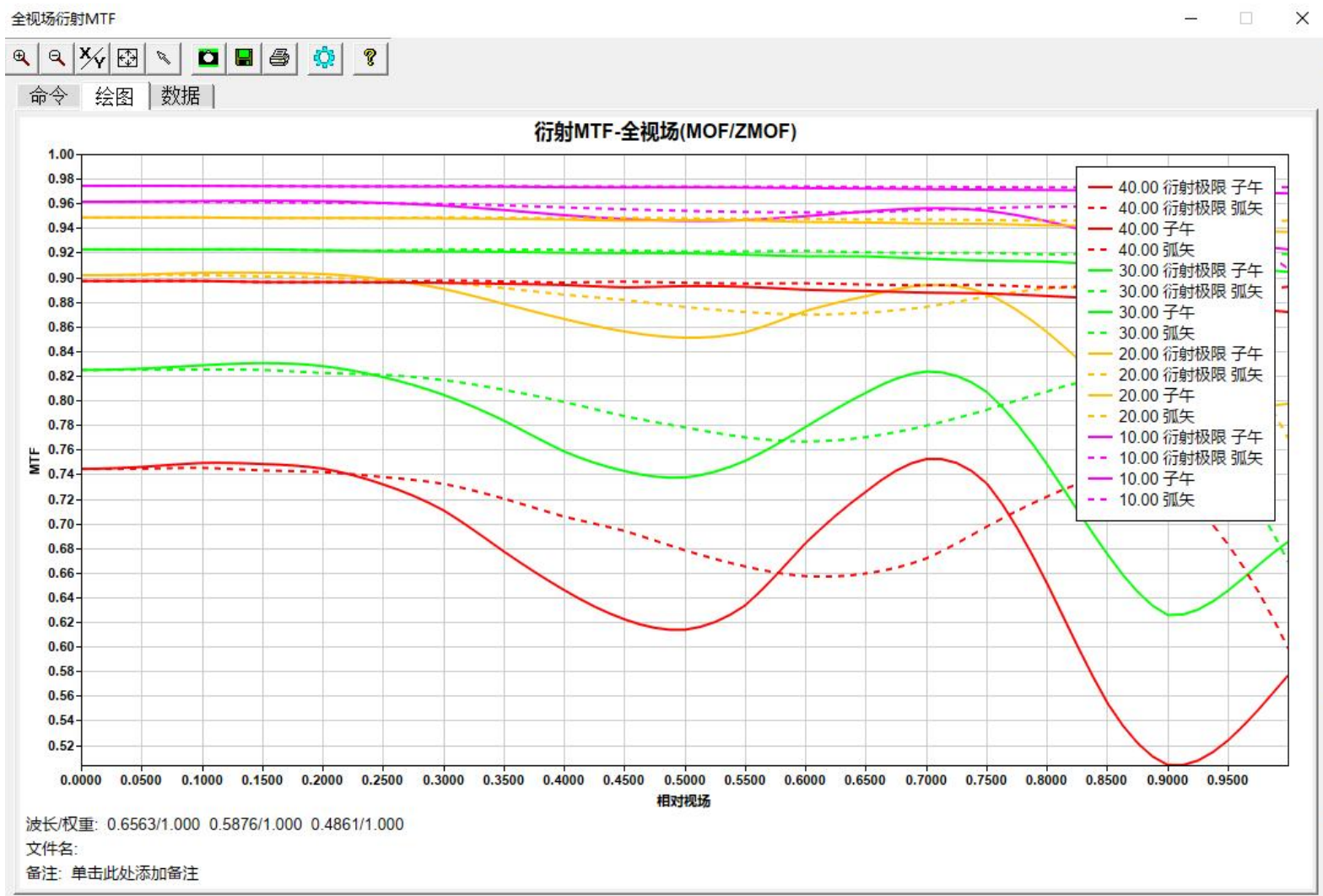
分数X-视场 (GBAR): ☐ 全扫描 (-1到2)

网格 (GRID) 20到80

☒ Quiet

命令行:
MOF M 0 50 80 0 Q

全视场衍射MTF



玻璃的属性

•环境特性的类型

```
--- ARGLASS 3 QUIET ! Start of ARGLASS input. 开始ARGLASS输入
Lens number      3 ID TEST PSD III
GLASS N-SF66      HAS BEEN ASSIGNED TO SURFACE 9; MERIT = 0.322238
GLASS N-SF57      HAS BEEN ASSIGNED TO SURFACE 5; MERIT = 0.286097
GLASS N-LASF40    HAS BEEN ASSIGNED TO SURFACE 13; MERIT = 0.293147
GLASS N-LAK7      HAS BEEN ASSIGNED TO SURFACE 3; MERIT = 0.297373
GLASS N-LAK7      HAS BEEN ASSIGNED TO SURFACE 11; MERIT = 0.318417
GLASS N-LAK14     HAS BEEN ASSIGNED TO SURFACE 1; MERIT = 0.326103
GLASS N-KF9       HAS BEEN ASSIGNED TO SURFACE 7; MERIT = 0.327548
```

•玻璃的属性，在命令窗口输入PGA ALL

```
*****
GLASS ATTRIBUTE FOR SURFACE NO. 1
SCHOTT      N-LASF40
GLASS IS A PREFERRED TYPE.
GLASS IS ENVIRONMENTALLY SAFE (NO Pb OR As) .

PRICE  BUBBLE  HUMIDITY  STAIN  ACID RESIST  ALKALI RESIST  SP GRAVITY
  6.0      1      1      2      5      1      4.55
THIS GLASS HAS A LIST OF TRANSMISSION VALUES ATTACHED
VALID RANGE OF TRANSMISSION DATA:
LOW      HIGH
  0.365    2.500
GLASS HAS SELLMIEIER INDEX COEFFICIENTS:
  1.9855030E+00 2.7405700E-01 1.2894570E+00 1.0958330E-02 4.7455160E-02 9.6908530E+01
GLASS HAS 6 DNDT VALUES FROM GLASS TABLE:
  8.1000E-06 1.2500E-08 -1.7300E-11 8.2700E-07 1.0800E-09 2.3800E-01
THERMAL COEFFICIENT (ALPHA) = 0.584E-05
```

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