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PROGRAM etorp
*****
* Conversion of dielectric functions to p-and s- reflectivity.      *
* from standard input it reads                                     *
* input file name for epsilon for the ordinary and extraordinary directions.
* angle of incidence in degree
* the lightray scatters in the yz plane
* z is the surface normal
* for s-polarization E parr x
* for p-polarization E parr yz
* the input files must have the format x elx e2x ely e2y elz e2z      *
* The output comes as: x real(crs) aimag(crs) real(crp) aimag(crp)    *
*****
REAL X(100000),elx,e2x,ely,e2y,elz,e2z,angle,cst,snt2
complex epsilx(100000),epsily(100000),epsilz(100000),cn,cb,crp,crs
INTEGER I,mm
character*40 flin
read(*,'(a40)') flin
open(23,file=flin)
read(*,*) angle
angle=angle*3.14159265/180
cst=cos(angle)
snt2=1-cst*cst
mm=100000
do 10 i=1,mm
  READ(23,*,END=11) X(i),elx,e2x,ely,e2y,elz,e2z
  epsilx(i)=cplx(elx,e2x)
  epsily(i)=cplx(ely,e2y)
  epsilz(i)=cplx(elz,e2z)
10 continue
close(23)
11 mm=i-1
do 25 i=1,mm
  cn=csqrt(epsilz(i)-snt2)
  cb=csqrt(epsilz(i))*csqrt(epsily(i))*cst
  crp=(cb-cn)/(cb+cn)
  cn=csqrt(epsilx(i)-snt2)
  crs=(cst-cn)/(cst+cn)
  write(*,*) x(i),real(crs),aimag(crs),real(crp),aimag(crp)
25 continue
END

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