

PROGRAM angle

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C=====
C   THIS PROGRAM CALCULATES epsilon, and from there delta and psi
C=====
  REAL wmn,wmx,x,epsinf,wp,gp
  * ,teta,pi,sn1,cs1,sn2,cs2,rho,psi,delta
  COMPLEX eps,n1,n2,rp,rs,rps
  INTEGER i,nw
  read(*,*) epsinf,wp,gp
  READ(*,*) wmn,wmx,nw
  read(*,*) teta
  pi=4.*atan(1.)
  teta=teta*pi/180
  sn1=sin(teta)
  sn2=sn1**2
  cs2=1.-sn2
  cs1=sqrt(cs2)
  do 10 i=1,nw
    x=wmn+real(I-1)*(wmx-wmn)/real(nw)
    w=abs(x)
    eps=epsinf-wp**2/(w*(w+cplx(0.,gp)))
    n1=eps*cs1
    n2=csqrt(eps-sn2)
    rp=(n1-n2)/(n1+n2)
    n1=cs1
    rs=(n1-n2)/(n1+n2)
    rps=rp/rs
    rho=real(cabs(rps))
    psi=atan(rho)
    delta=aimag(clog(rps))
    if (x.gt.0) then
      write(*,*) x,psi
    else
      write(*,*) x,delta
    endif
  10 continue
  END
```