

Ingenieurbüro Baumann --- www.leobaumann.de --- Markt 6, 46282 Dorsten  
 manuelle Berechnung eines vertikalen Kreuz-Dipols vor Reflektor über perfektem Grund  
 h = Länge, l = Wellenlänge, b2 = Höhe über Grund, d1 = Reflektorabstand

- `reset():digits:=16:k:=1/1000:wh:=90*PI/180:vw:=77.25*PI/180:b2:=1/2:d1:=1/2:h:=1/2:l:=1:d2=1/1000:k1:=h/l:`

Richtdiagramm im Kugelraum als Funktion der Winkel

- `c:=(the,phil) -> (abs((cos(PI*h/l*cos(the-k)*sin(phil))-cos(PI*h/l))/sqrt(1-cos(the-k)^2*sin(phil)^2)))*2*abs(cos(PI*2*d1/l*sin(phil)*sin(the)))*2*abs(sin(PI*2*b2/l*cos(phil)))+abs((cos(PI*h/l*cos(phil))-cos(PI*h/l))/sin(phil)))*2*abs(cos(PI*2*d1/l*cos(the)*sin(phil)))*2*abs(cos(PI*2*b2/l*cos(phil))):`

Antennenimpedanzen nach BALANIS mittengespeist

- `float(30*(EULER+ln(2*PI*k1)-Ci(2*PI*k1)+1/2*sin(2*PI*k1)*(Si(4*PI*k1)-2*Si(2*PI*k1))+1/2*cos(2*PI*k1)*(EULER+ln(PI*k1)+Ci(4*PI*k1)-2*Ci(2*PI*k1))));`

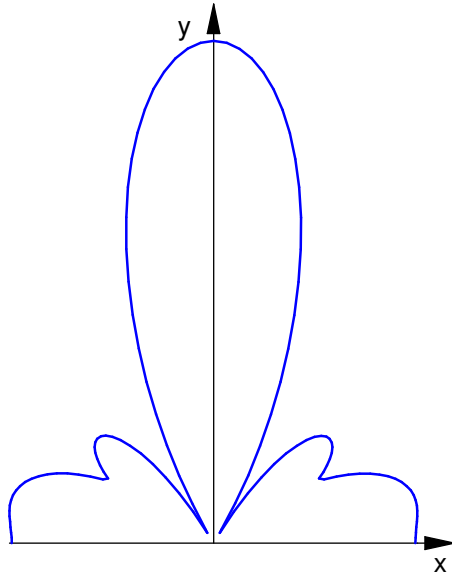
36.5648009

- `float(15*(2*Si(2*PI*k1)+cos(2*PI*k1)*(2*Si(2*PI*k1)-Si(4*PI*k1))-sin(2*PI*k1)*(2*Ci(2*PI*k1)-Ci(4*PI*k1)-Ci(2*2*PI*d2^2/4/k1/l^2))));`

21.27227364

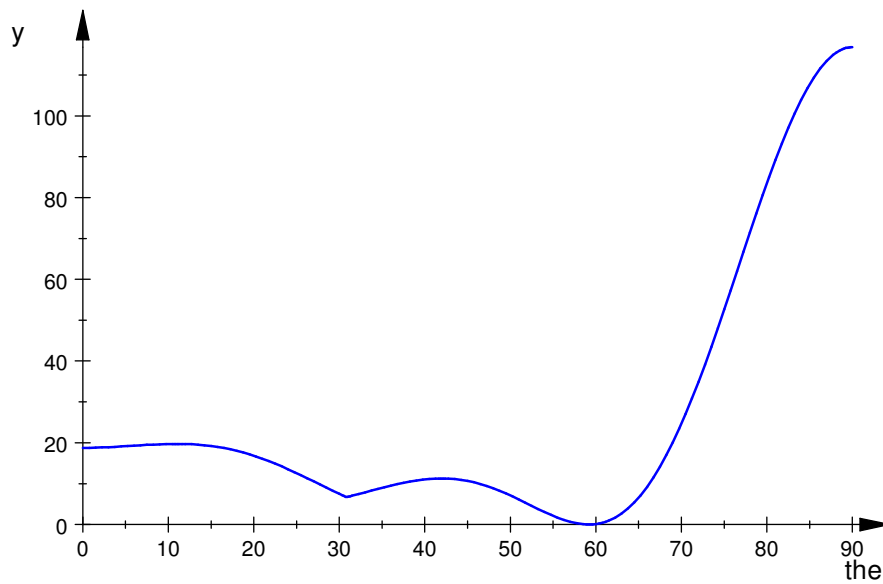
Horizontaldiagramm

- `plot(plot::Polar([c(the,vw),the], the = 0..PI, TicksNumber=None, Scaling=Constrained));`



horizontale relative Strahlungsleistungsdichte

- `plotfunc2d(c(the*PI/180,wv)^2, the = 0..90):`



Maximalwert der relativen Strahlungsleistungsdichte , auch in dBi, Erhebungswinkel 0 Grad

- `ghmax:=0:ghwmax:=0:for m from 0 to 2879 step 1 do  
gh:=float(c(m*PI/5760,wv)^2);  
if gh>ghmax then  
ghmax:=gh;  
ghwmax:=float(m/32);  
end_if;  
end_for:ghmax;float(10*ln(ghmax)/ln(10)+2.15);ghwmax;`

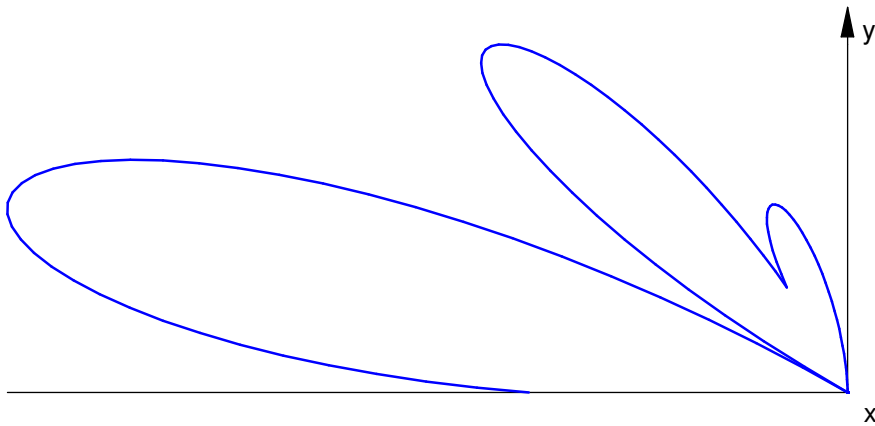
116.8077747

22.8247175

89.96875

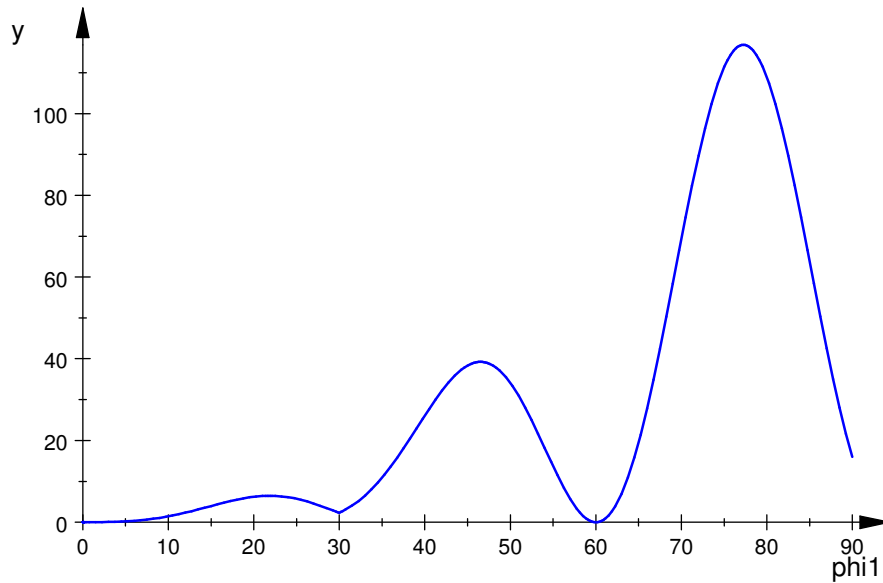
Vertikaldiagramm

- `plot(plot::Polar([c(wh,phi1),phi1+PI/2], phi1 = 0..PI/2, TicksNumber=None, Scaling=Constrained));`



vertikale relative Strahlungsleistungsdichte

- `plotfunc2d(c(wh,phi1*PI/180)^2, phi1 = 0..90):`



Maximalwert der relativen Strahlungsleistungsdichte , auch in dBi

- ```

gvmax:=0:gvwmax:=0:for m from 1 to 2880 step 1 do
gv:=float(c(wh,m*PI/5760)^2);
if gv>gvmax then
    gvmax:=gv;
    gvwmax:=float(m/32);
end_if;
end_for:gvmax;float(10*ln(gvmax)/ln(10)+2.15);gvwmax;

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116.8082711

22.82473596

77.25

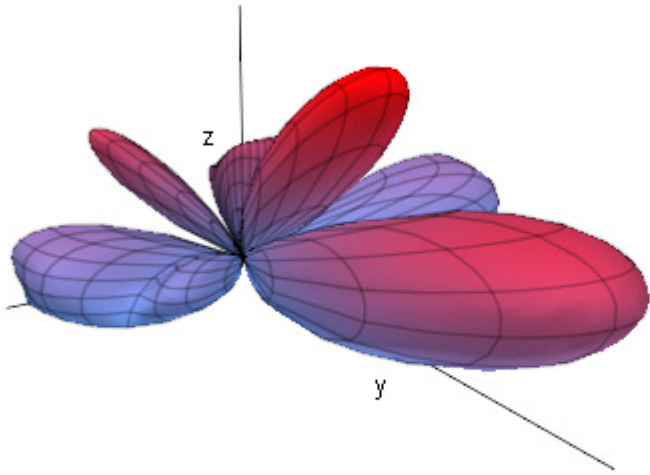
- ```

delete
the,phi1:graph:=plot::Surface([cos(the)*sin(phi1)*c(the,phi1),sin(th
e)*sin(phi1)*c(the,phi1),cos(phi1)*c(the,phi1)],the=-PI..0,
phi1=0..PI/2,Axes=Origin, TicksNumber=None, Scaling=Constrained,
AdaptiveMesh=4):

```
- ```

plot(graph);

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