

Ingenieurbüro Baumann --- www.leobaumann.de --- Markt 6, 46282 Dorsten  
 manuelle Berechnung eines vert. Duo-Quads (2 nebeneinander) vor einem Reflektor über Grund  
 h = Länge, b2 = Höhe über Grund (Unterkante), d = Distanz Parallele, d1 = Distanz Reflektor, l =  
 Wellenlänge

- `reset():digits:=16:w:=90*PI/180:vw:=59*PI/180:wh:=90*PI/180:h:=1/2:d:=1/2:d1:=1/2:b2:=1/2:l:=1:`

Richtdiagramm im Kugelraum als Funktion der Winkel

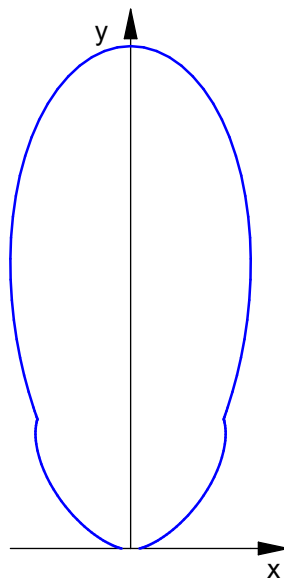
- `c:=(the,phil) -> abs((cos(PI*h/l*cos(phil))-cos(PI*h/l))/sin(phil))  
 *2*abs(cos(PI*d/l*cos(the)*sin(phil)))  
 *2*abs(cos(PI*2*d/l*cos(the)*sin(phil)))  
 *2*abs(cos(PI*d1/l*cos(the)*sin(phil)))  
 *2*abs(cos(PI*2*(b2+h/2)/l*cos(phil)))  
 +abs((cos(PI*2*d/l*cos(the)*sin(phil))-  
 cos(PI*2*d/l))/sqrt(1-cos(the)^2*sin(phil)^2))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

Antennenimpedanz nach 4nec2 einseitig mittengespeist

- `Z:=169+I*19.5;`  
 $169.0 + 19.5 \cdot i$

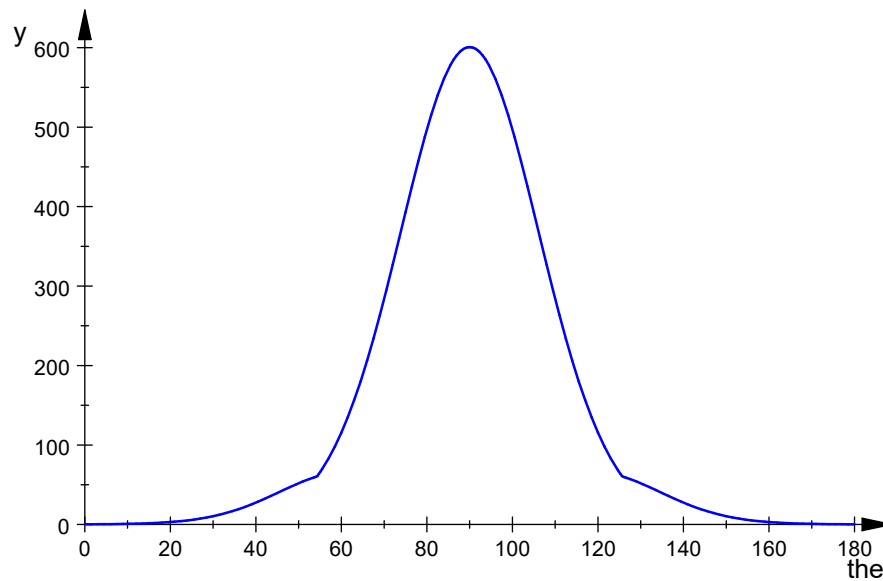
Horizontaldiagramm

- `plot(plot::Polar([c(the,vw),the], the = 0..PI, TicksNumber=None,  
 Scaling=Constrained, AdaptiveMesh=4));`



### horizontale relative Strahlungsleistungsdichte

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



### Maximalwert der relativen Strahlungsleistungsdichte , auch in dBi

- `ghmax:=0:ghwmax:=0:for m from 0 to 2880 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*log(10,ghmax)+2.15);ghwmax;`

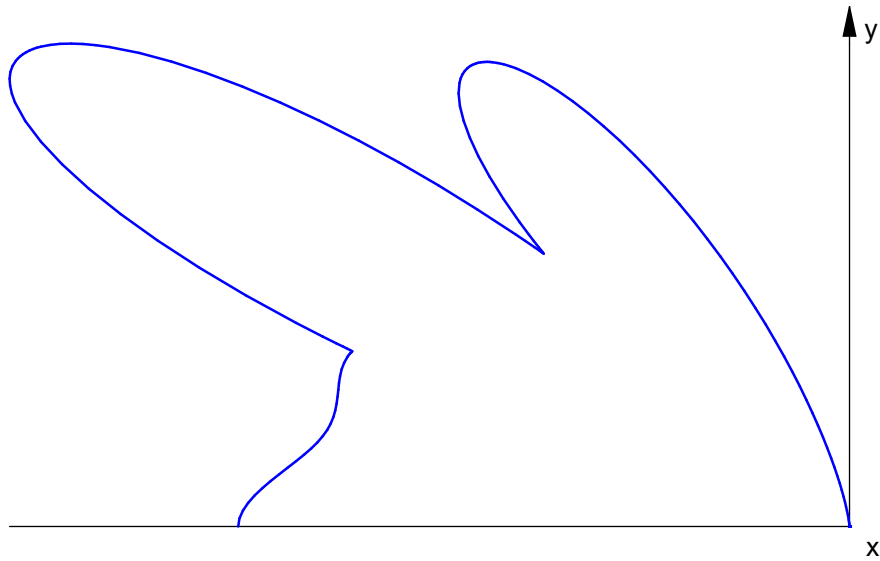
600.6626581

29.93630634

90.0

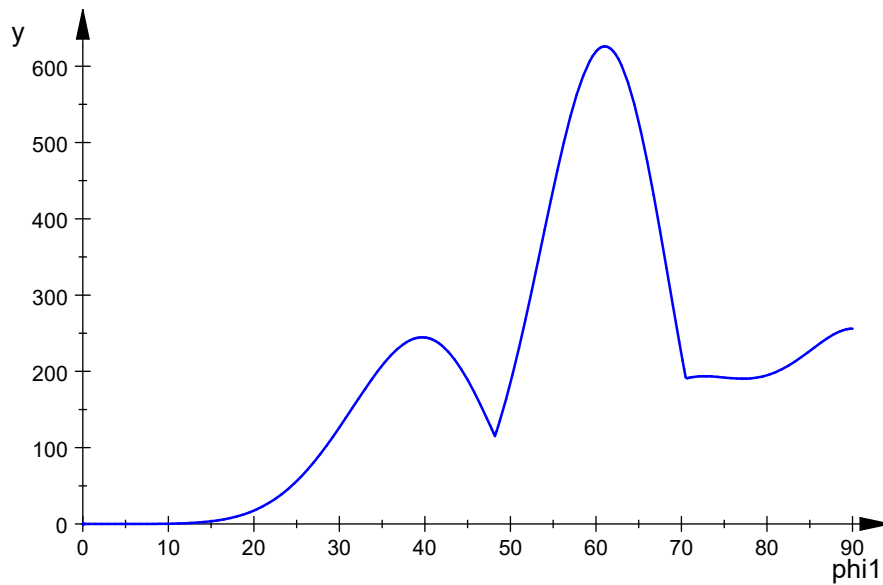
### Vertikaldiagramm

- `plot(plot::Polar([c(wh,phil),phil+PI/2], phil = 0..PI/2,  
TicksNumber=None, Scaling=Constrained, AdaptiveMesh=4));`



vertikale relative Strahlungsleistungsdichte

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



Maximalwert der relativen Strahlungsleistungsdichte , auch in dBi

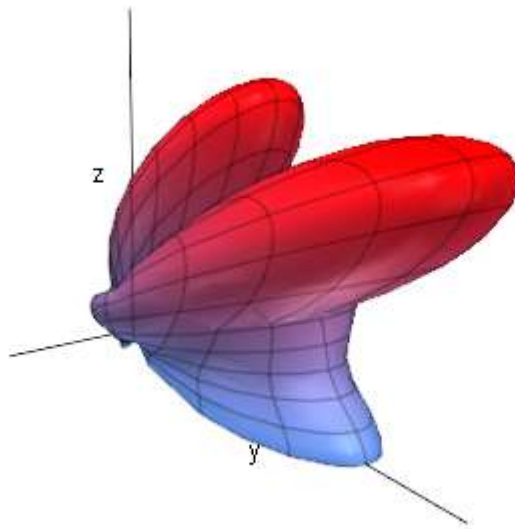
- `gvmax:=0:gvwmax:=0:for m from 1 to 2880 step 1 do  
gv:=float(c(wh,m*PI/5760)^2);  
if gv>gvmax then  
gvmax:=gv;  
gvwmax:=float(m/32);  
end_if;  
end_for:gvmax;float(10*log(10,gvmax)+2.15);gvwmax;`

625.9072517

30.11509983

61.03125

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



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