

Ingenieurbüro Baumann --- www.leobaumann.de --- 46282 Dorsten, Markt 6  
 manuelle Berechnung eines horizontalen 4x4-Quads (4 Quads nebeneinander) in einer Höhe b2 über Grund

h = Länge, d = Distanz, d1 = Distanz 2. Element, b2 = Höhe über Grund, l = Wellenlänge

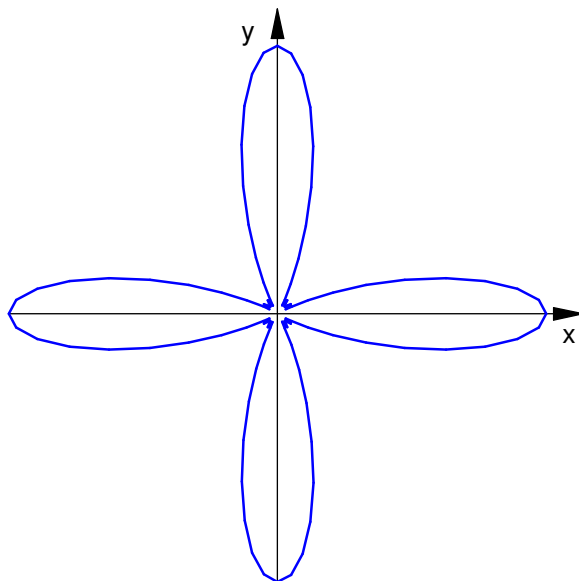
- `reset():digits:=16:wh:=0*PI/180:k:=1/1000:vw:=30.53*PI/180:w:=90*PI/180:h:=40:d:=h:b2:=12:l:=80:`

Richtdiagramm im Kugelraum als Funktion der Winkel

- `c:=(the,phil) -> (abs((cos(PI*4*h/l*cos(the-k)*sin(phil))-cos(PI*4*h/l))/(sqrt(1-cos(the-k)^2*sin(phil)^2)))  
 *2*abs(cos(PI*d/l*sin(phil)*sin(the)))  
 *2*abs(cos(PI*2*d/l*sin(phil)*sin(the)))  
 *2*abs(cos(PI*3*d/l*sin(phil)*sin(the)))  
 *2*abs(cos(PI*4*d/l*sin(phil)*sin(the)))  
 +abs((cos(PI*4*h/l*cos(the-w-k)*sin(phil))-cos(PI*4*h/l))/(sqrt(1-cos(the-w-k)^2*sin(phil)^2)))  
 *2*abs(cos(PI*d/l*sin(phil)*sin(the-w)))  
 *2*abs(cos(PI*2*d/l*sin(phil)*sin(the-w-k)))  
 *2*abs(cos(PI*3*d/l*sin(phil)*sin(the-w-k)))  
 *2*abs(cos(PI*4*d/l*sin(phil)*sin(the-w-k)))  
 *2*abs(sin(PI*2*b2/l*cos(phil)))):`

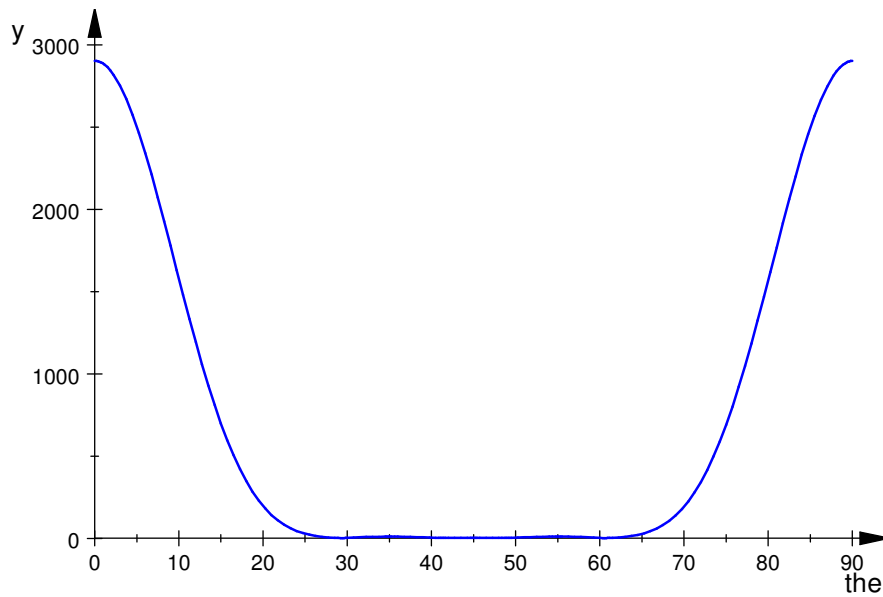
Horizontaldiagramm

- `plot(plot::Polar([c(the,vw),the], the = 0..2*PI, TicksNumber=None, Scaling=Constrained));`



horizontale relative Strahlungsleistungsdichte

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



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*ln(ghmax)/ln(10)+2.15);ghwmax;

```

2902.419281

36.7776015

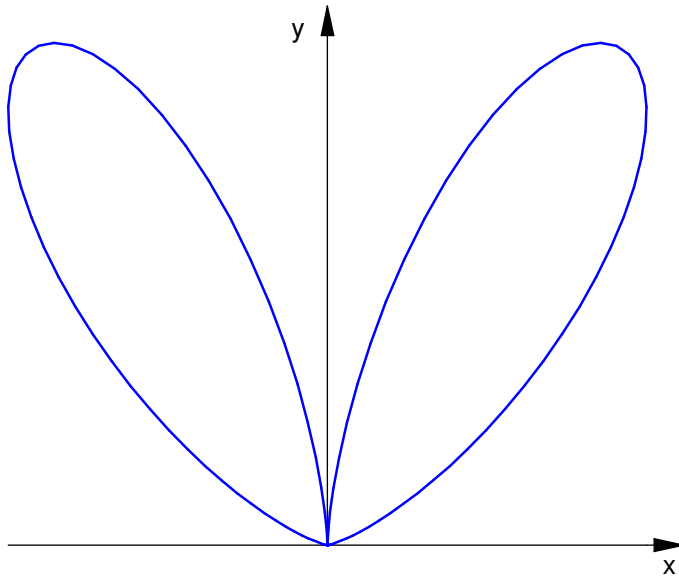
0.0

Vertikaldiagramm

- ```

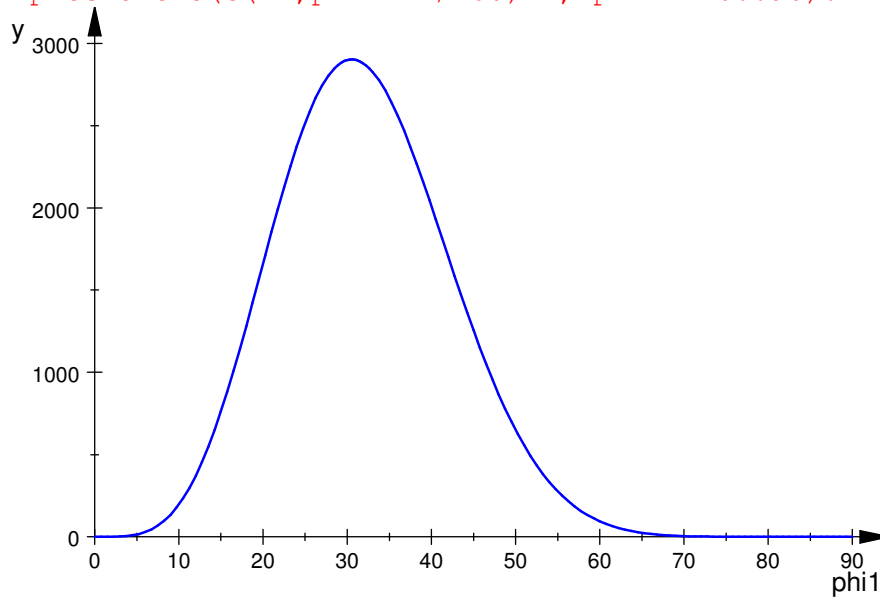
plot(plot::Polar([c(wh,phil),phil+PI/2], phil = -PI/2..PI/2,
TicksNumber=None, Scaling=Constrained));

```



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 0 to 2879 step 1 do  
gv:=float(c(wh,m*PI/5760)^2);  
if gv>gvmax then  
gvmax:=gv;  
gvwmax:=float(m/32);  
end_if;`

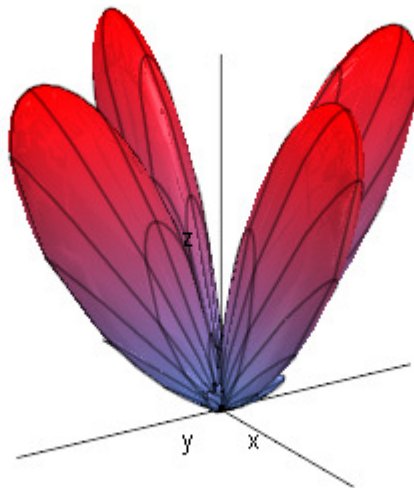
```
end_for:gvmax;float(10*ln(gvmax)/ln(10)+2.15);gvwmax;
```

2902.419232

36.77760143

30.53125

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



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