Ingenieurbüro Baumann --- www.leobaumann.de --- Markt 6, 46282 Dorsten
manuelle Berechnung eines vert. 5x5-Quads vor einem Reflektor über Grund
h = Länge, b2 = Höhe über Grund (Unterkante), d = Distanz Parallele, d1 = Distanz Reflektor, l = Wellenlänge

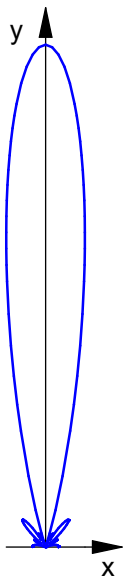
```
reset():digits:=16:w:=90*PI/180:wv:=40.21875*PI/180:wh:=90*PI/180:h:=1/2:d:=1/2:d1:=1/2:b2:=0.15:l:=1:
```

Richtdiagramm im Kugelraum als Funktion der Winkel

```
c:=(the,phi1) -> abs((cos(PI*5*h/l*cos(phi1))-cos(PI*5*h/l))/sin(phi1))
                 *2*abs(cos(PI*d/l*cos(the)*sin(phi1)))
                 *2*abs(cos(PI*2*d/l*cos(the)*sin(phi1)))
                 *2*abs(cos(PI*3*d/l*cos(the)*sin(phi1)))
                 *2*abs(cos(PI*4*d/l*cos(the)*sin(phi1)))
                 *2*abs(cos(PI*5*d/l*cos(the)*sin(phi1)))
                 *2*abs(cos(PI*d1/l*cos(the)*sin(phi1)))
                 *2*abs(cos(PI*2*(b2+5*h/2)/l*cos(phi1)))
                 +abs((cos(PI*5*d/l*cos(the)*sin(phi1))-cos(PI*5*d/l))/sqrt(1-cos(the)^2*sin(phi1)^2))
                 *2*abs(sin(PI*h/l*cos(phi1)))
                 *2*abs(sin(PI*2*h/l*cos(phi1)))
                 *2*abs(sin(PI*3*h/l*cos(phi1)))
                 *2*abs(sin(PI*4*h/l*cos(phi1)))
                 *2*abs(sin(PI*5*h/l*cos(phi1)))
                 *2*abs(sin(PI*d1/l*sin(phi1)*sin(the)))
                 *2*abs(sin(PI*2*(b2+5*h/2)/l*cos(phi1))):
```

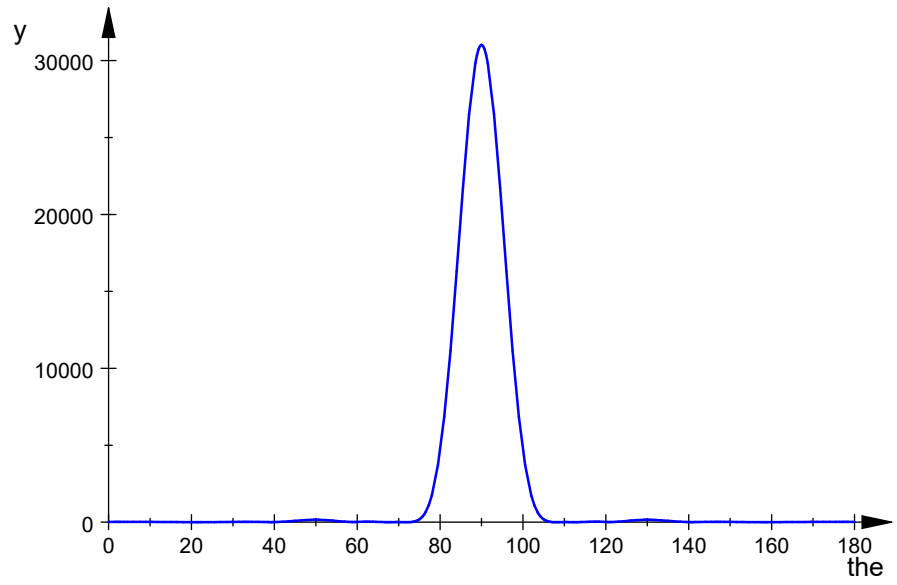
Horizontaldiagramm

```
plot(plot::Polar([c(the,wv),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 Stahlungsleistungsdichte , auch in dBi

- ```
  ghmax:=0:ghwmax:=0:for m from 1 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*log(10,ghmax)+2.15);ghwmax;
  ```

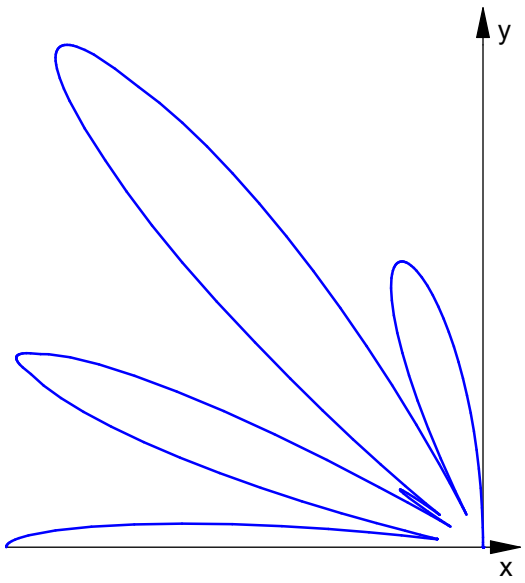
  31025.97225

  47.067254

  89.96875

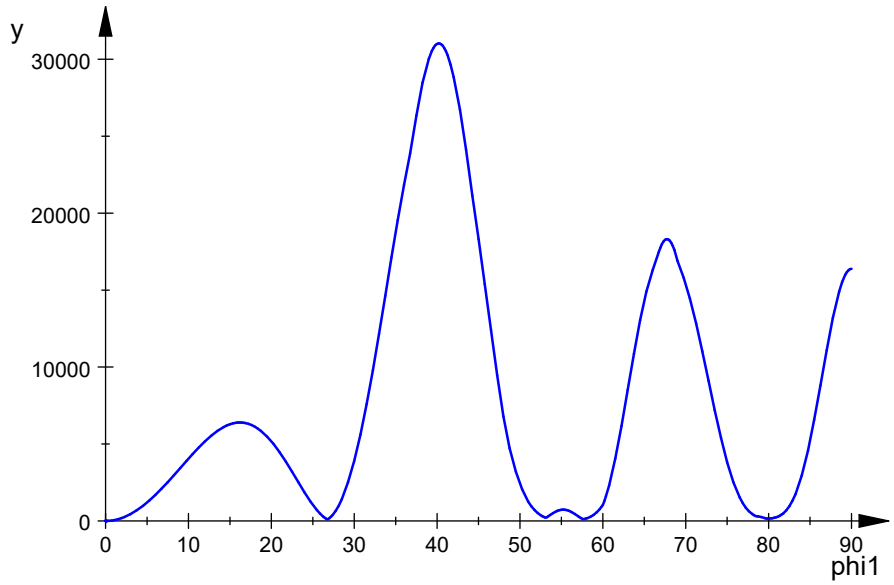
Vertikaldiagramm

- ```
  plot(plot::Polar([c(wh,phi1),phi1+PI/2], phi1 = 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 Stahlungsleistungsdichte , auch in dBi

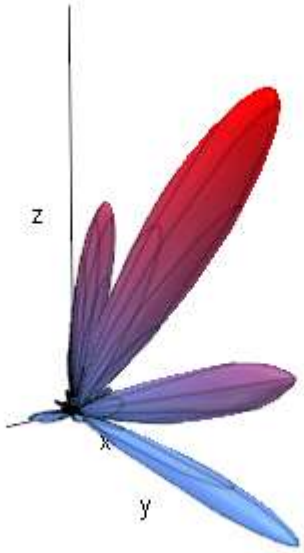
- ```
  gvmax:=0:gvwmax:=0:for m from 1 to 2879 step 1 do
  gv:=float(c(wh,m*PI/5760)^2);
  if gv>gvmax then
        gvmax:=gv;
        gvwmax:=float(m/32);
  end_if;
  end_for:gvmax;float(10*log(10,gvmax)+2.15);gvwmax;
  ```
  ```

31026.49805

47.0673276

40.21875

- ```
  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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