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

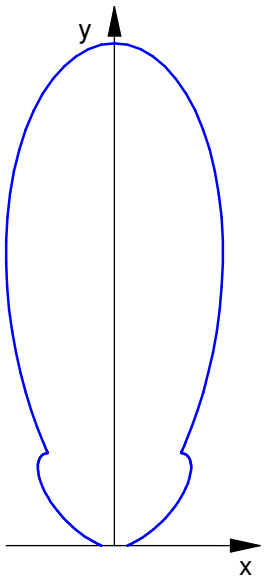
Antennenimpedanz nach 4nec2 einseitig mittengespeist

```
Z:=169+I*19.5;
```

$$169.0 + 19.5 \cdot i$$

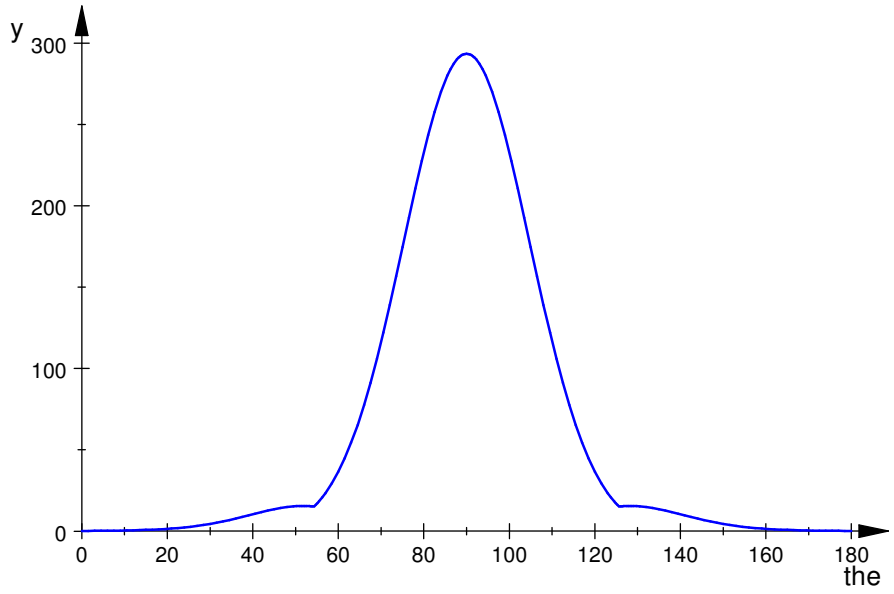
Horizontaldiagramm

```
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 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;
  ```

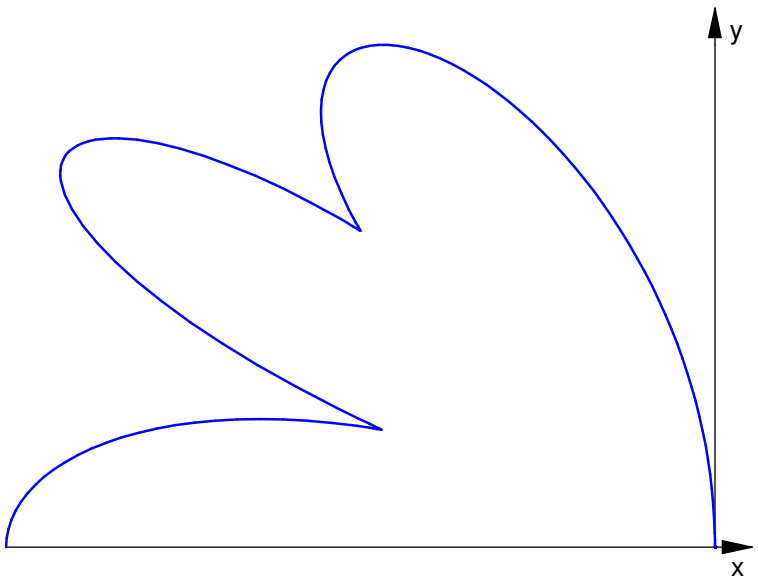
  293.3876447

  26.82441821

  90.0

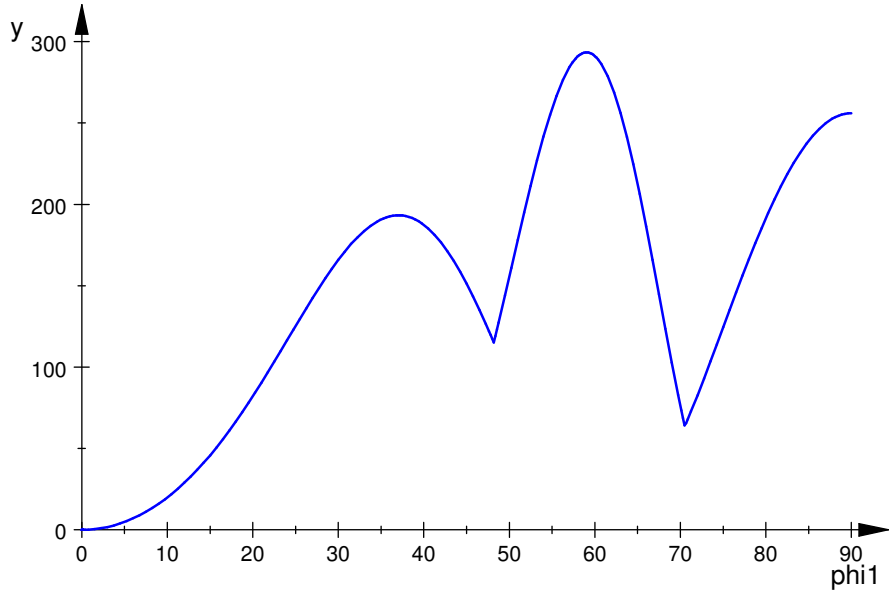
Vertikaldiagramm

- ```
  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

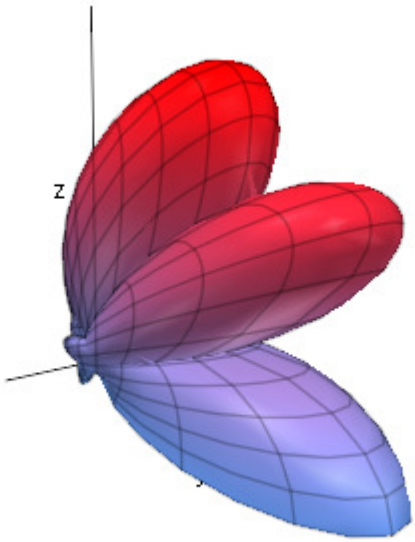
```
gvmax:=0:gvwmax:=0:for m from 1 to 2880 step 1 do
gv:=float(c(wh,m*PI/5760)^2);
if gv>gvmax then
     gvmax:=gv;
     gvwmax:=float(m/32);
end_if;
end_for:gvmax;float(10*ln(gvmax)/ln(10)+2.15);gvwmax;
```

293.3876447

26.82441821

59.0

- ```
  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);
  ```



-