Ingenieurbüro Baumann --- www.leobaumann.de --- Markt 6, 46282 Dorsten
manuelle Berechnung eines vert. Quads
h = Länge, bet = Phasenverschiebung, l = Wellenlänge

```
reset():digits:=16:wv:=58.90625*PI/180:wh:=90*PI/180:h:=1/2:d:=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)))
                 +abs((cos(PI*d/l*cos(the)*sin(phi1))-
  cos(PI*d/l))/sqrt(1-cos(the)^2*sin(phi1)^2))
                 *2*abs(sin(PI*h/l*cos(phi1))):
```

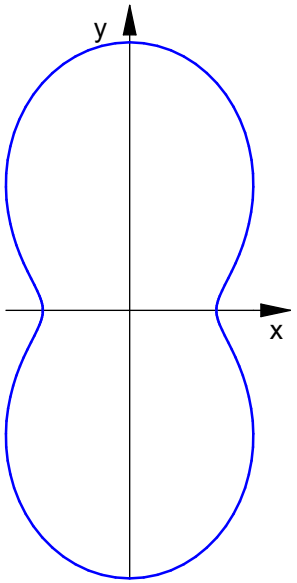
Antennenimpedanz nach 4nec2 einseitig mittengespeist

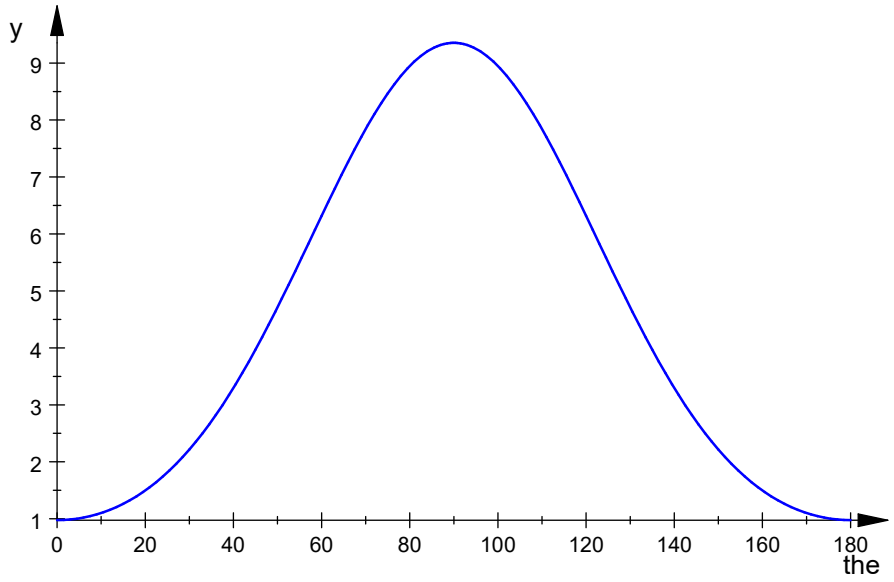
```
Z:=115+I*17.4;
```

$$115.0 + 17.4 \cdot i$$

Horizontaldiagramm

```
plot(plot::Polar([c(the,wv),the], the = 0..2*PI, TicksNumber=None,
Scaling=Constrained, AdaptiveMesh=4));
```





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*log(10,ghmax)+2.15);ghwmax;
```

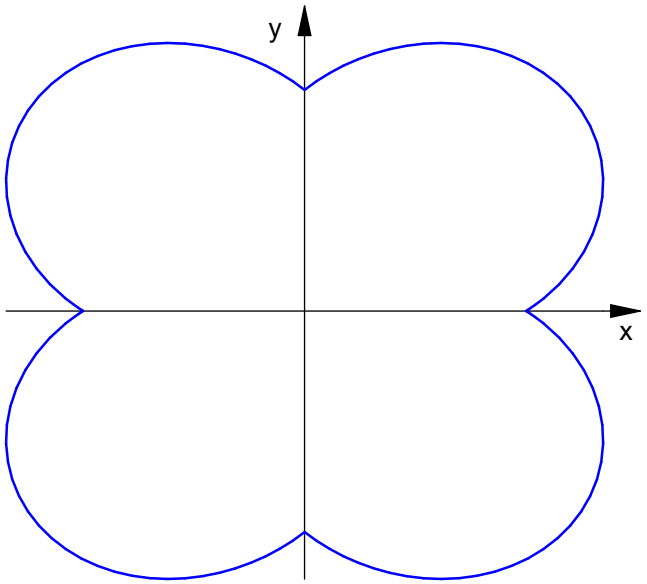
9.354784733

11.86033798

90.0

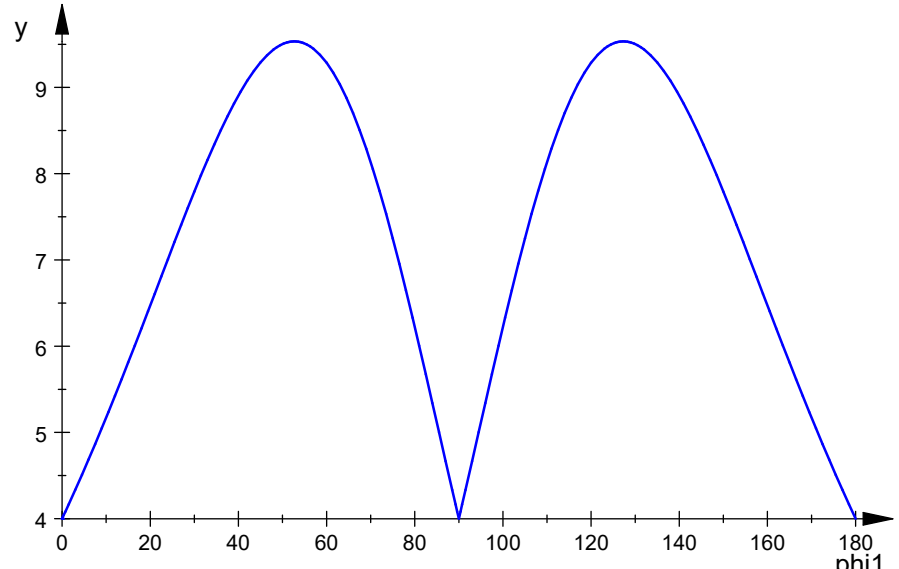
Vertikaldiagramm

```
plot(plot::Polar([c(wh,phi1),phi1+PI/2], phi1 = -PI..PI,
TicksNumber=None, Scaling=Constrained, AdaptiveMesh=4));
```



vertikale relative Strahlungsleistungsdichte

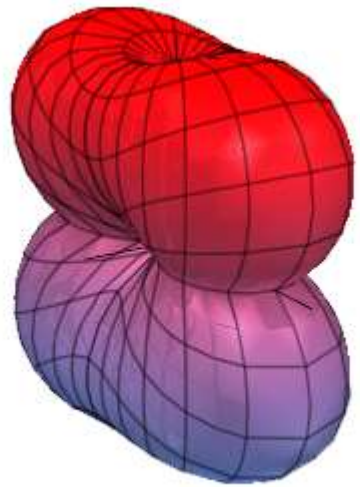
- `plotfunc2d(c(wh,phi1*PI/180)^2, phi1 = 0..180):`



11.94255295

52.6875

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



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