

```
> restart:
```

```
Check MMA (Mathematica) solution
```

```
> power := S^2*(X - Y)^2*Rload/(R + Rload)^2;  
MMA := [X=309.918, Y=304.91, Rload=8.48585, Rth= 8.66666, S=  
0.0476431];
```

$$power := \frac{S^2 (X - Y)^2 Rload}{(R + Rload)^2}$$

```
MMA := [X=309.918, Y=304.91, Rload=8.48585, Rth=8.66666, S=0.0476431] (1)
```

```
> vars := indets(power, name);  
D2 := [seq(diff(power, v$2), v in vars)];  
vars := {R, Rload, S, X, Y}
```

$$D2 := \left[\frac{6 S^2 (X - Y)^2 Rload}{(R + Rload)^4}, -\frac{4 S^2 (X - Y)^2}{(R + Rload)^3} + \frac{6 S^2 (X - Y)^2 Rload}{(R + Rload)^4}, \right. \\ \left. \frac{2 (X - Y)^2 Rload}{(R + Rload)^2}, \frac{2 S^2 Rload}{(R + Rload)^2}, \frac{2 S^2 Rload}{(R + Rload)^2} \right] (2)$$

```
> # check
```

```
eval(D2, MMA)
```

$$\left[\frac{2.898513087}{(R + 8.48585)^4}, -\frac{0.2277134357}{(R + 8.48585)^3} + \frac{2.898513087}{(R + 8.48585)^4}, \frac{425.6513222}{(R + 8.48585)^2}, \right. \\ \left. \frac{0.03852346744}{(R + 8.48585)^2}, \frac{0.03852346744}{(R + 8.48585)^2} \right] (3)$$

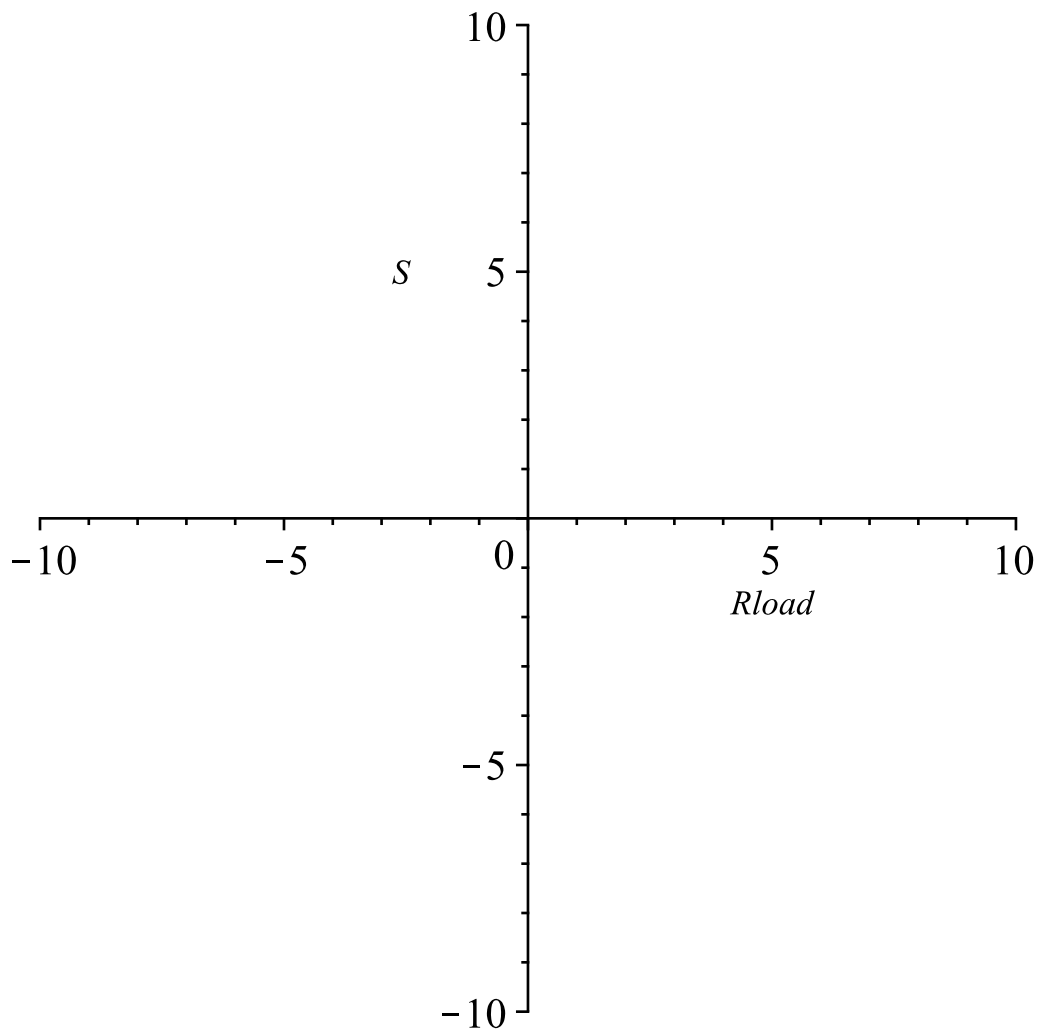
```
> # MMA's solution is not a maximum but a saddle point
```

```
> mma := map(u -> if lhs(u) in vars then u end if, MMA);  
mma := [X=309.918, Y=304.91, Rload=8.48585, S=0.0476431] (4)
```

```
> cl := NULL;  
for k1 from 1 to 3 do  
  for k2 from k1+1 to 4 do  
    k := [k1, k2];  
    m := select(`not`@`in`, [$1..4], k);  
    r := seq(lhs(mma[m[n]])=0.5*rhs(mma[m[n]])..1.5*rhs(mma[m[n]]  
), n=1..2);  
    cl := cl, plots:-contourplot(eval(power, mma[k]), r, title=  
typeset(fixed=lhs~(mma[k])), size=[400, 400])  
end do;  
end do;
```

Error, (in plot/iplot2d/levelcurve) could not evaluate expression

```
> plots:-display(`<|>`(cl))
```



> The patterns around an extremum

```
expl := a^2+b^2+c^2+d^2;
plots:-contourplot(eval(expl, [a=0, b=0]), c=-1..1, d=-1..1,
title=typeset(fixed=[a,b]))
```

Error, missing operator or `;`