

## Four programs are included

```
alpha_Er_surf2.m  
microwave_0.C  
microwave_2d.C  
microwave_solution.C
```

### 1. alpha\_Er\_surf2.m in Matlab

This is included only for completeness. Does not need to be tested, I used this to develop the concept.

I used Matlab because I know it to some degree, then I used root scripts and C++, to use the concept.

### 2. Program number one microwave\_0.C.

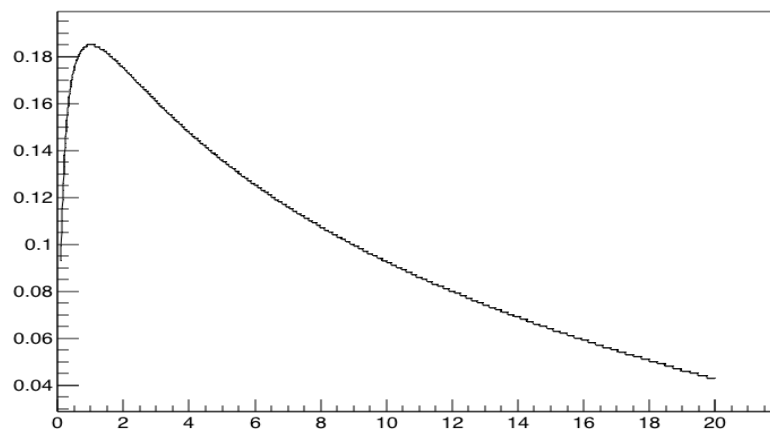
I include this for completeness. This program tested the translation from Matlab to C++.

It can be run root

```
microwave_0.C
```

The user answers 'd' for demonstration or any other character - then program would ask for the values.

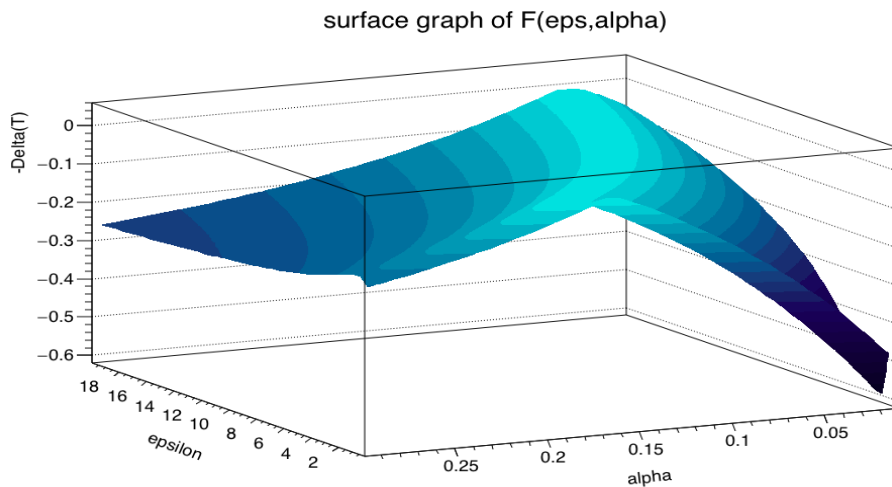
Graph



3. First program submitted is `microwave_2d.C`.

This program shows how one measurement can be handled the Transmission coefficient  $T$  is evaluated on a 2-dim mesh of points and plotted is  $-\text{abs}(T - T_m)$ .

The negative is chosen because it shows the curve of possible solution in the plane  $z=0$  - as a "roof" on the plotted surface.



To run this simply type root

`microwave_2d.C`

The user answers 'd' for demonstration or any other character - then program would ask for the values.

4. The final program `microwave_solution.C`  
finding the solution pair  $\text{Alpha}$ ,  $\epsilon_r$  as the intersection of the two curves.

To run this, simply type root

`microwave_solution.C.`

The user answers 'd' for demonstration or any other character - then program would ask for the values.

Here is the output of the demonstration run:

