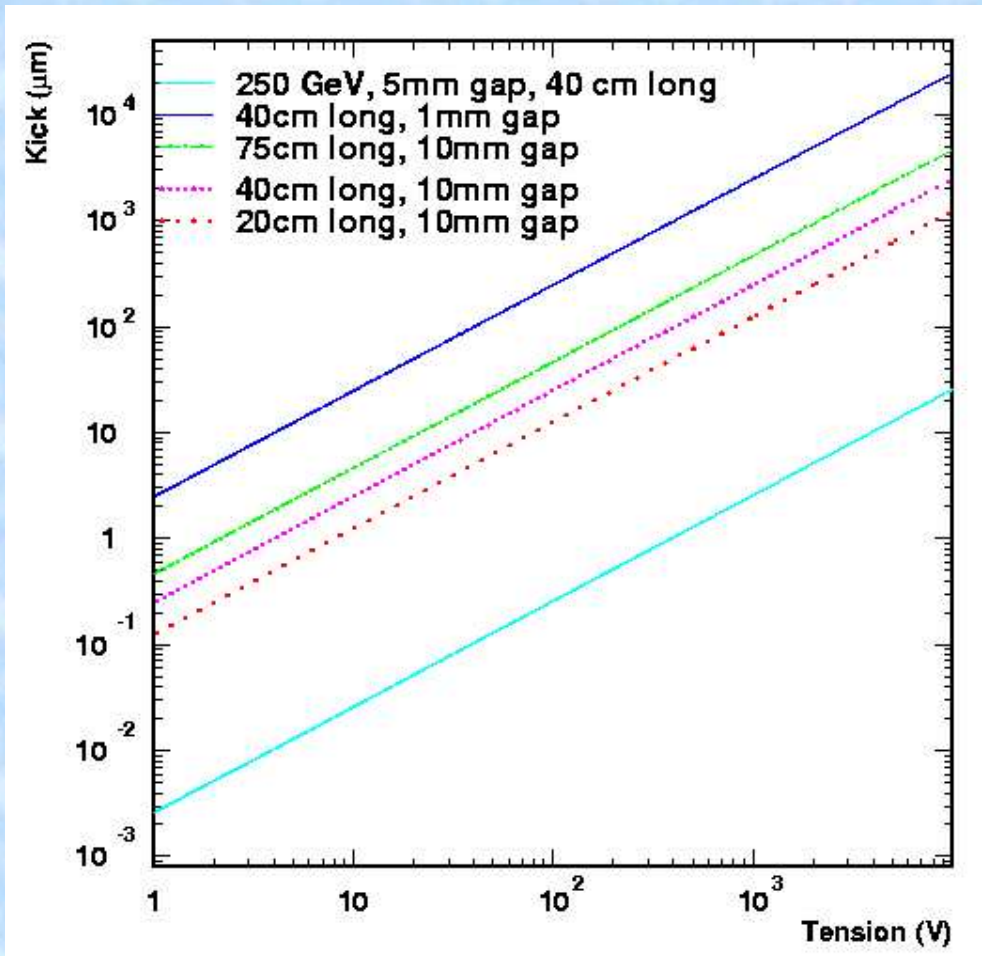


Design of a kicker with a movable electrode

- Why a movable electrode?
- Simulation method & variables
- Electrode without support
- Electrode with conducting support
- Electrode with isolating support
- Effect of the bolts
- Final design

Why a movable electrode?



The smaller the gap between the two electrodes is, the better kick angle you get.

But

small gap is a problem in a test facility where beam may have high offsets

Thus a movable electrode is wanted

Simulation method

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& variables

The POISSON/SUPERFISH code developed at Los Alamos was used for the simulations.

Electrostatic simulations in a 2D layout

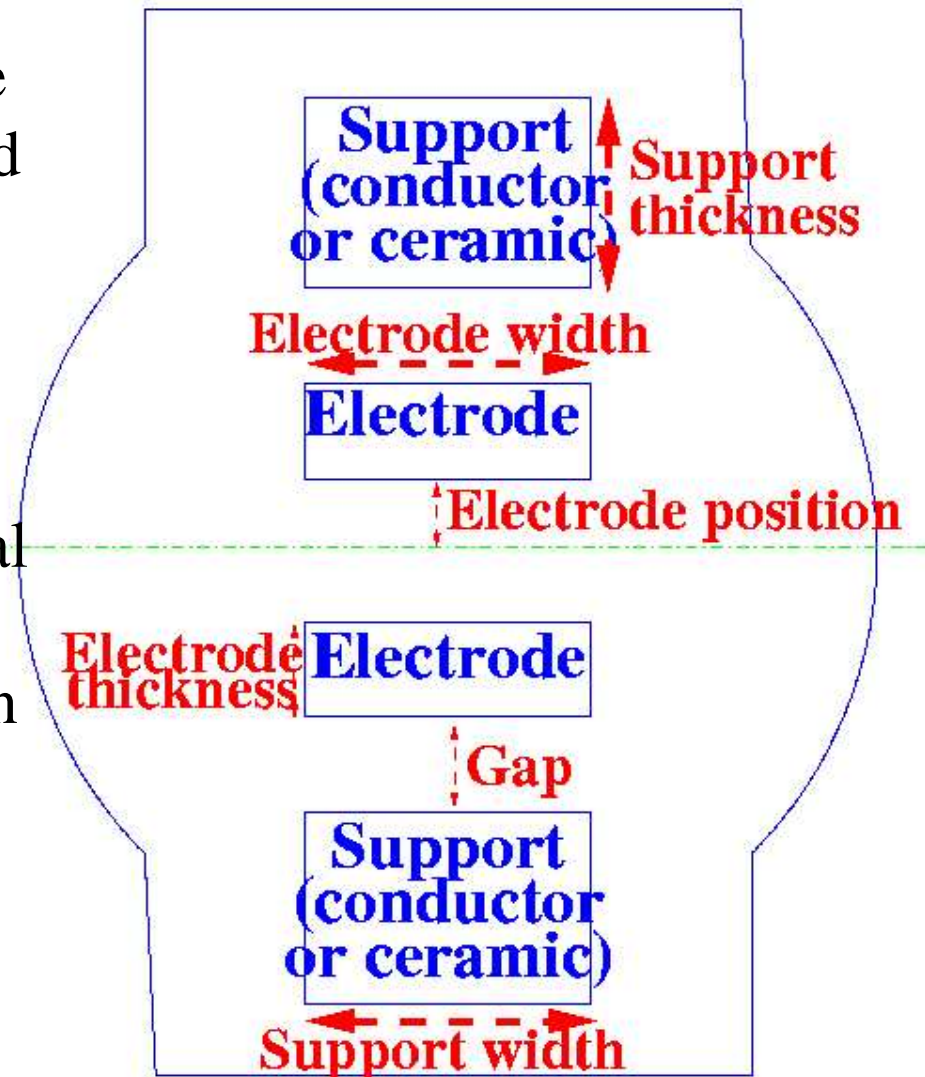
More than 1000 simulations in total

4 different classes of configuration have been studied:

- Without support
- With conducting support
- With insulating support
- With ceramic support + bolts

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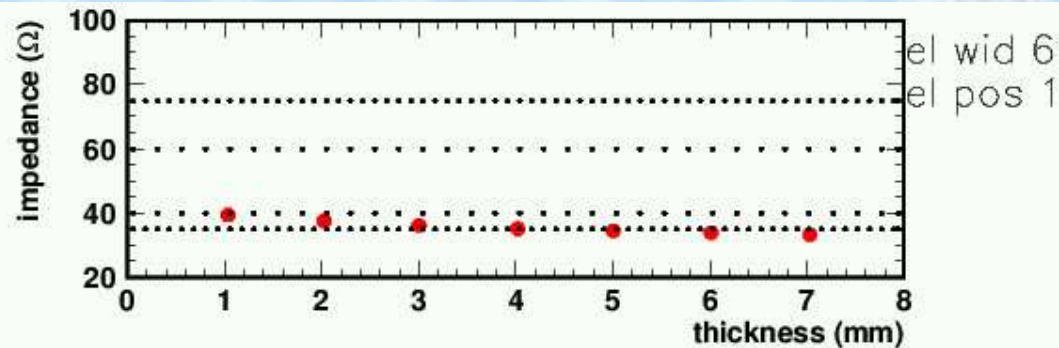
Electrode without support

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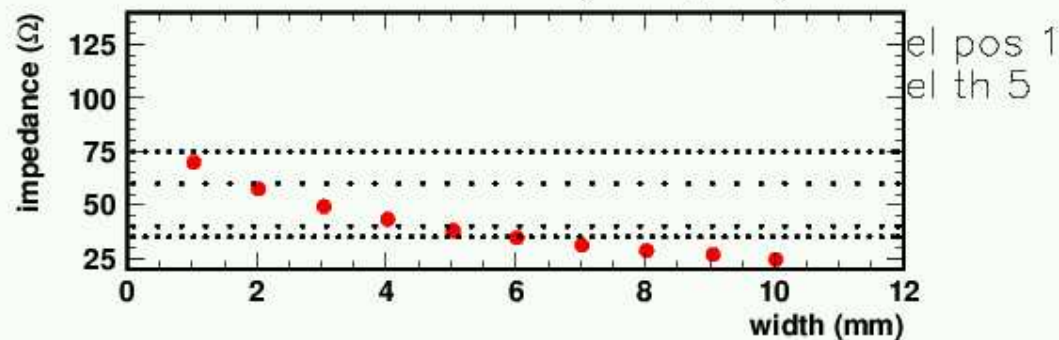


Thicker electrode have a lower impedance, as well as wider electrodes.

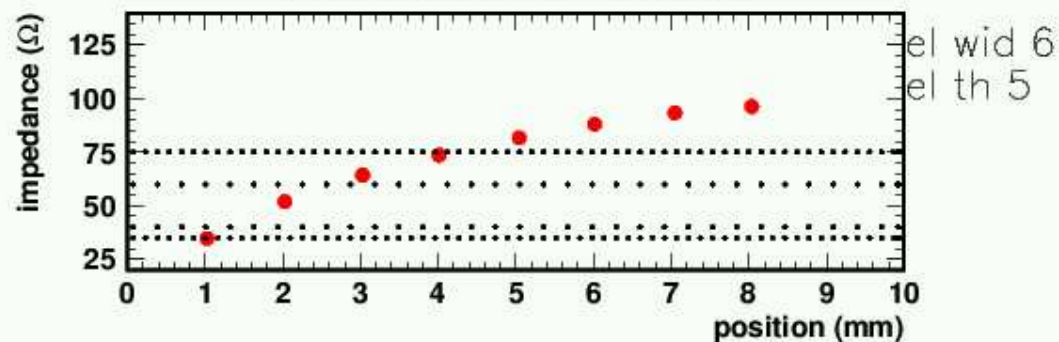
Impedance decreases when the electrodes are brought close from each other.



Electrode thickness (no support)



Electrode width (no support)



Electrode position (no support)

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Electrode with conducting support

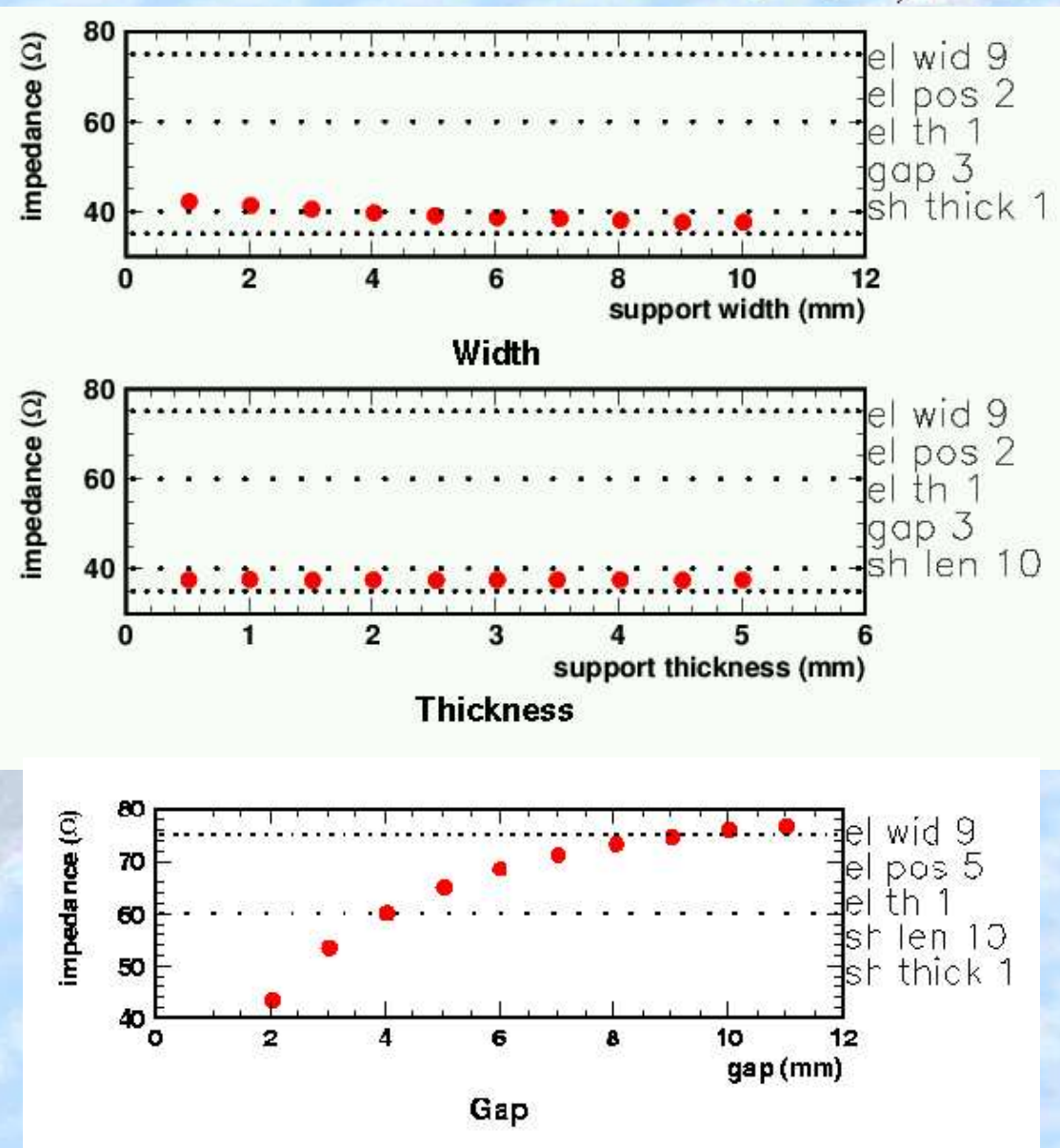
Dimensions of the support
have almost no influence
on the electrode's
impedance

Closer supports reduce
the impedance
of the electrode

Electrode variables have
the same effect than
previously

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Electrode with insulating support

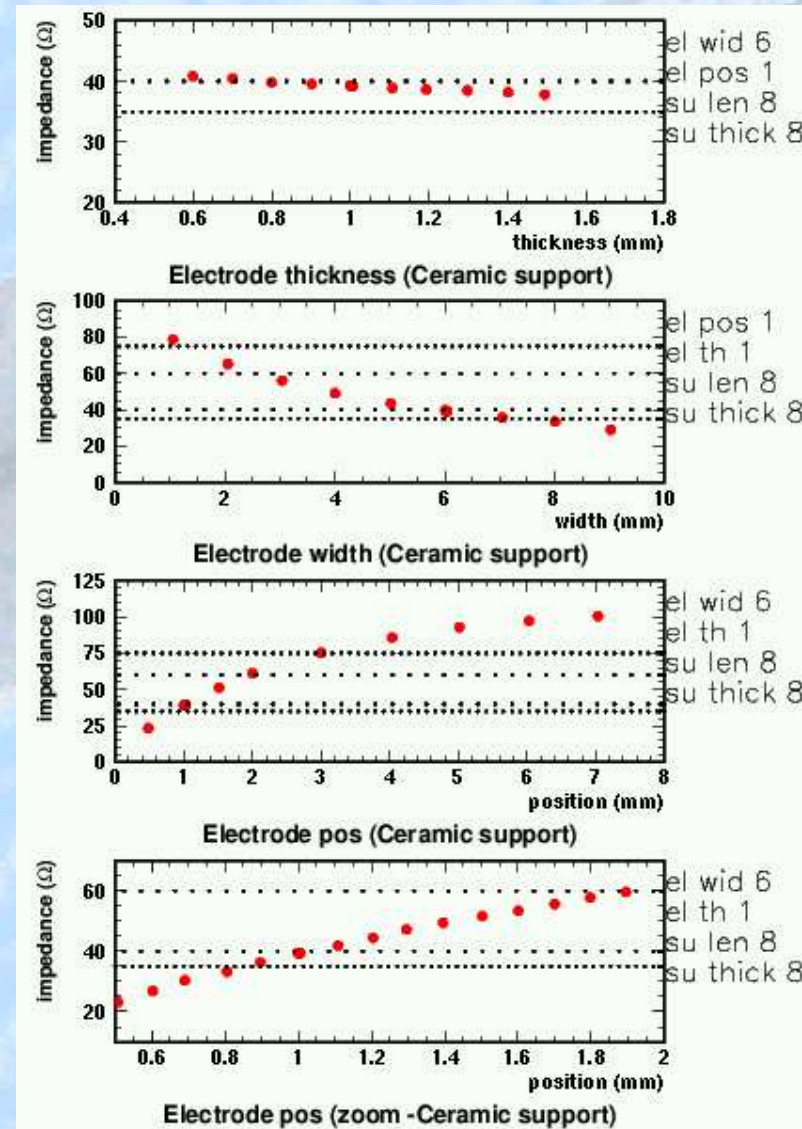
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Dimensions of the support have almost no influence on the electrode's impedance

Electrode variables have the same effect than in other cases

Difficult to reach 50 ohms with the other constraints



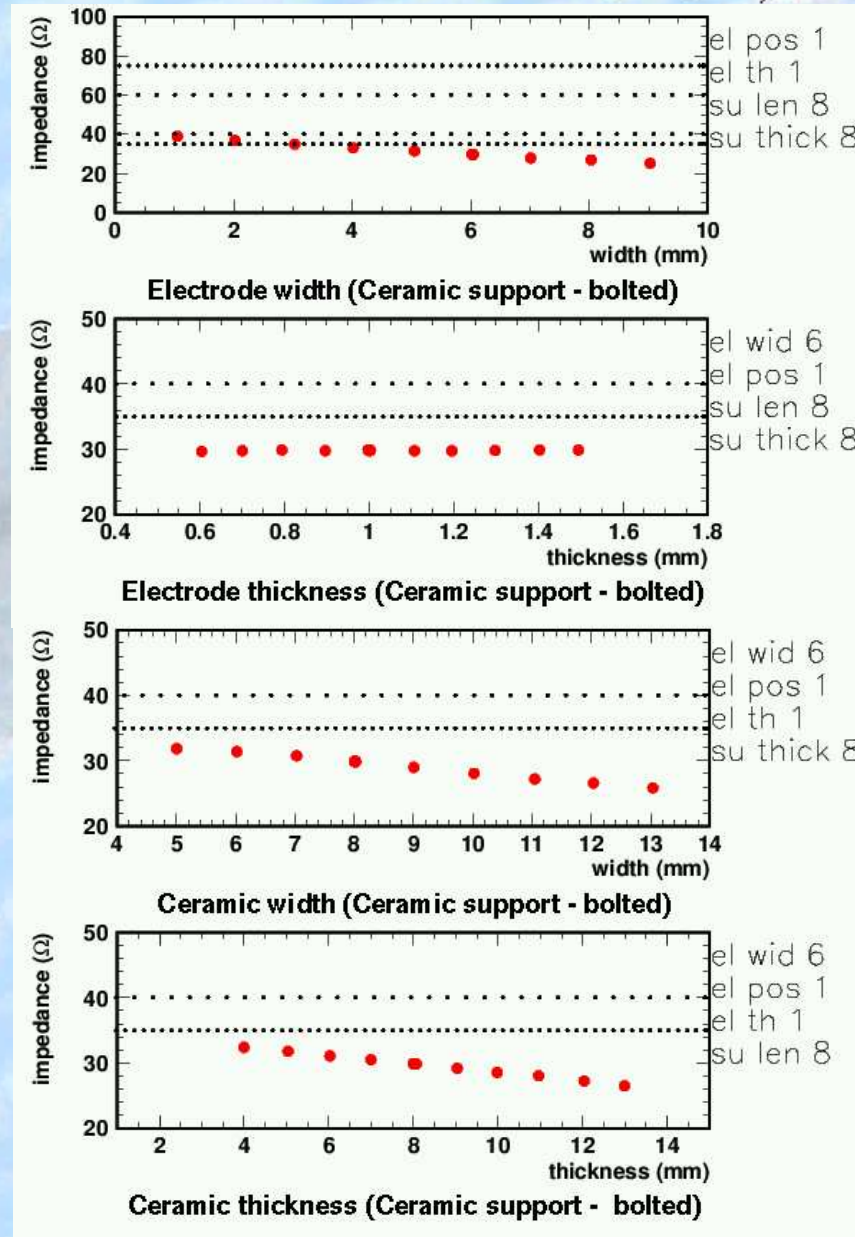
Electrode bolted on an insulating support

FEATHER (羽)



Bolts reduce the impedance

Now the support dimensions affect the impedance (as they affect the bolt's dimensions)

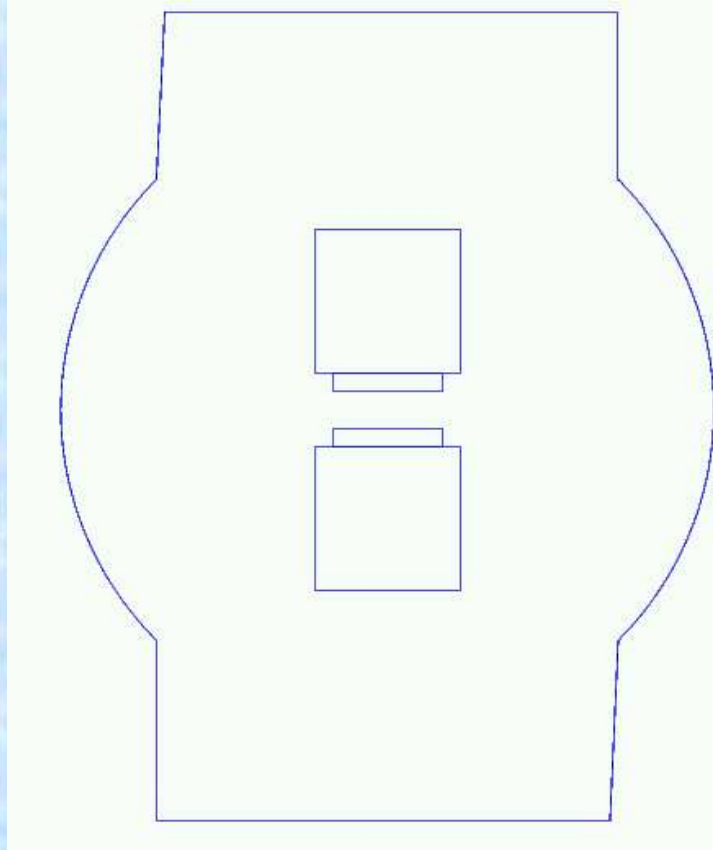


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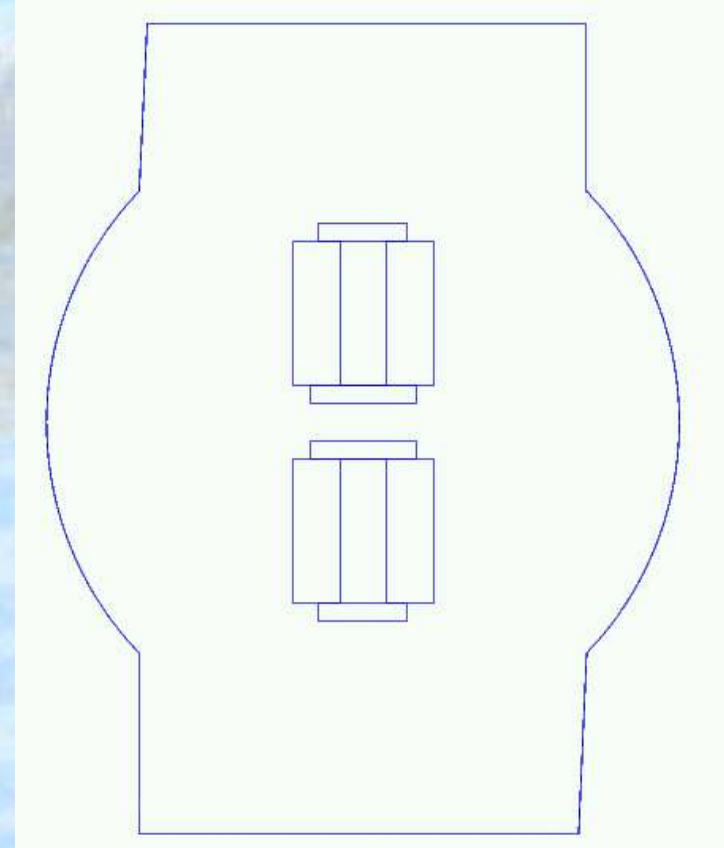
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Conclusion: Dimensions



Electrode:
Width 6mm
Thickness 1mm

Support (ceramic):
8x8 mm



Technical drawings have been reviewed, Kicker
should be ready before the next ATF run

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