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.
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
Electrode without support

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

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

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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

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.

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Electrode bolted on an insulating support

Bolts reduce the impedance

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