Optimization of the CeC Kicker's cross-section.

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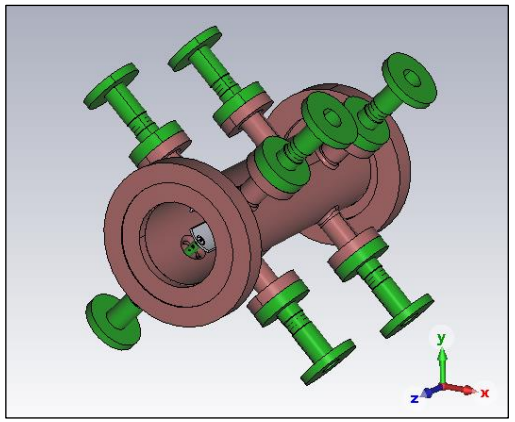
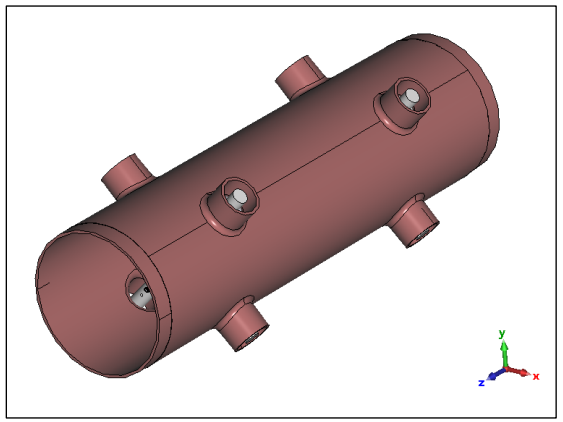
Proposed CeC kicker geometry

- Received the stripline kicker geometry (originally designed for the NSLS-II) from Cliff.
- It has four striplines, each having a length of 160 mm (**required 150 mm for the CeC**).
- Gap between two electrodes is 54.40 mm **(want 50 mm for the CeC)**

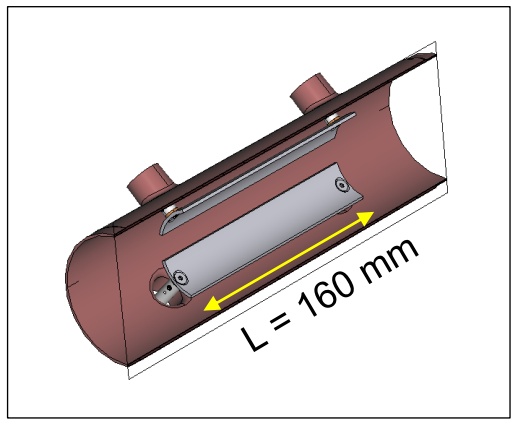
Initial geometry



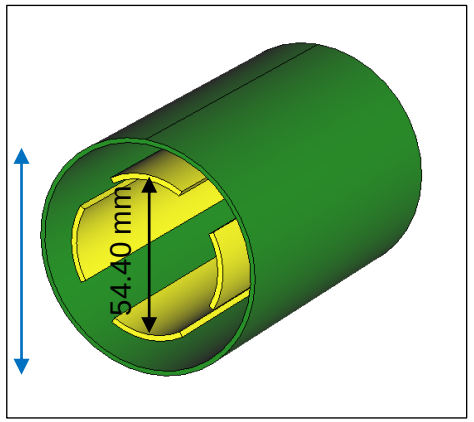
Simplified geometry



Cut view



Cross-section only



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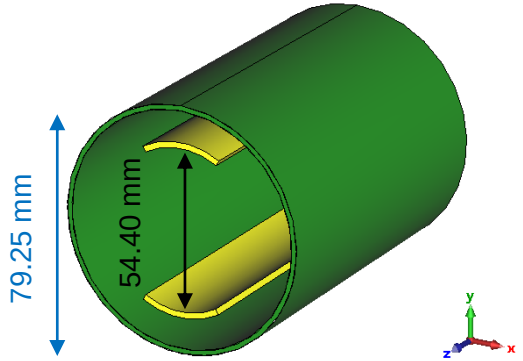
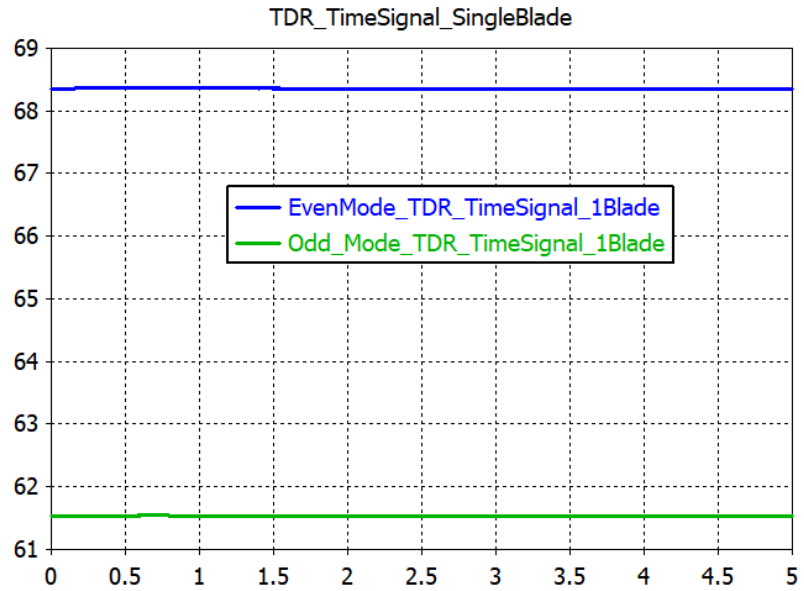
Characteristic impedance of the initial design

- The initial cross-section has housing diameter of 79.25 mm and gap between the electrodes of 54.40 mm.
- This cross-section (two electrodes) resulted the characteristic impedance of ~ 61.5 Ω (rather than 50 Ω) for the odd mode and ~ 68 Ω for the even mode.
- We want to optimize the cross-section to produce 50 Ω characteristic impedance.

Initial cross-section





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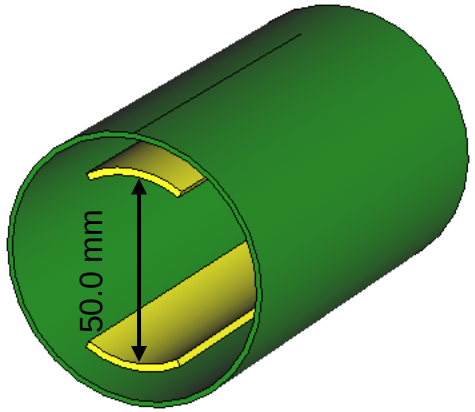
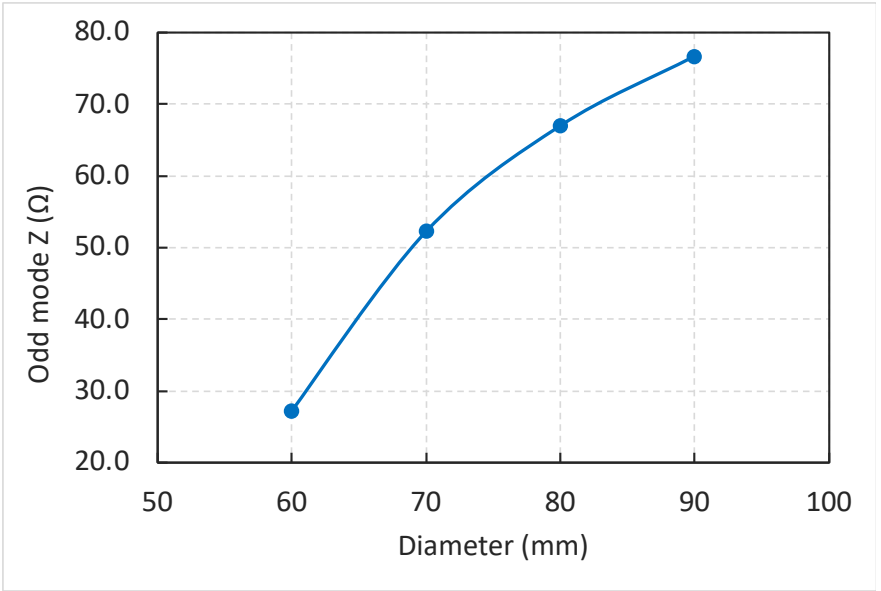
Impedance Optimization with the housing diameter

- We want 50 mm gap between the electrodes (Igor's slide).
- Optimized the kicker cross-section, to produce 50 Ω odd mode impedance for 50 mm gap, by changing the housing diameter.
- CST simulation showed that we need < 70 mm housing diameter to maintain 50 Ω.



Diameter (mm)	Odd mode Z (Ω)
60	27.23
70	52.26
80	67.00
90	76.69



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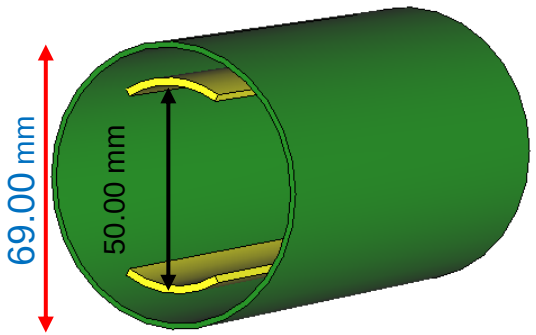
Optimized cross-section

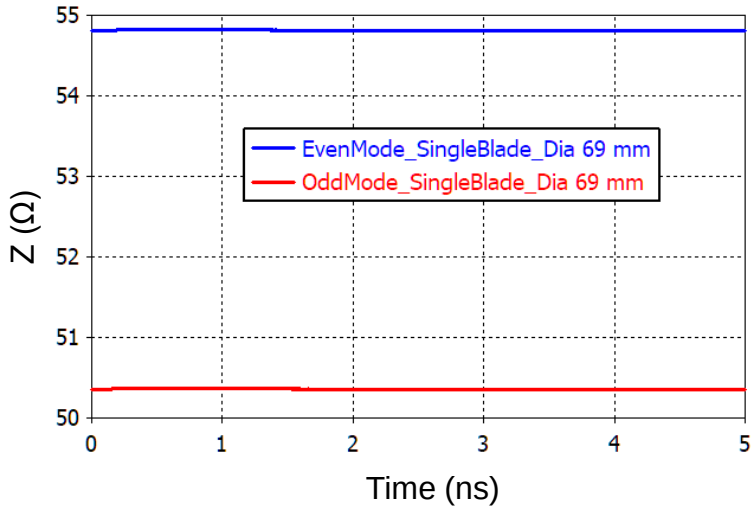
- Further optimized the housing diameter around 70 mm.
- 69 mm diameter (2-striplines) produced the odd mode impedance of 50.36 Ω and the even mode impedance of 54.80 Ω.
- The same cross-section with 4-striplines produced the odd mode impedance of 49.6 Ω.

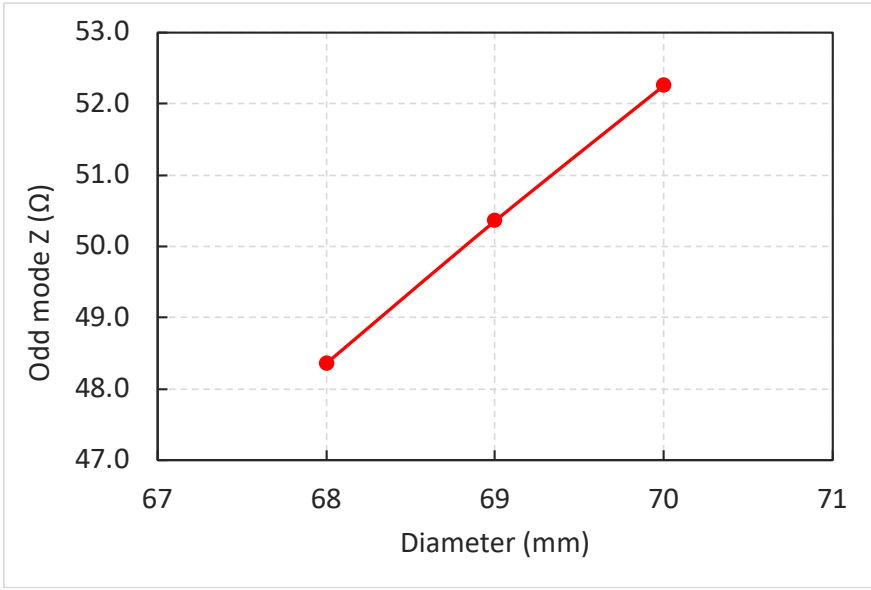
Diameter (mm)	Odd mode Z (Ω)
68	48.36
69	**50.36**
70	52.26

Optimized cross-section



TDR plot for the optimized cross-section





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