

Cavity Simulations for PETRA IV



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Overview

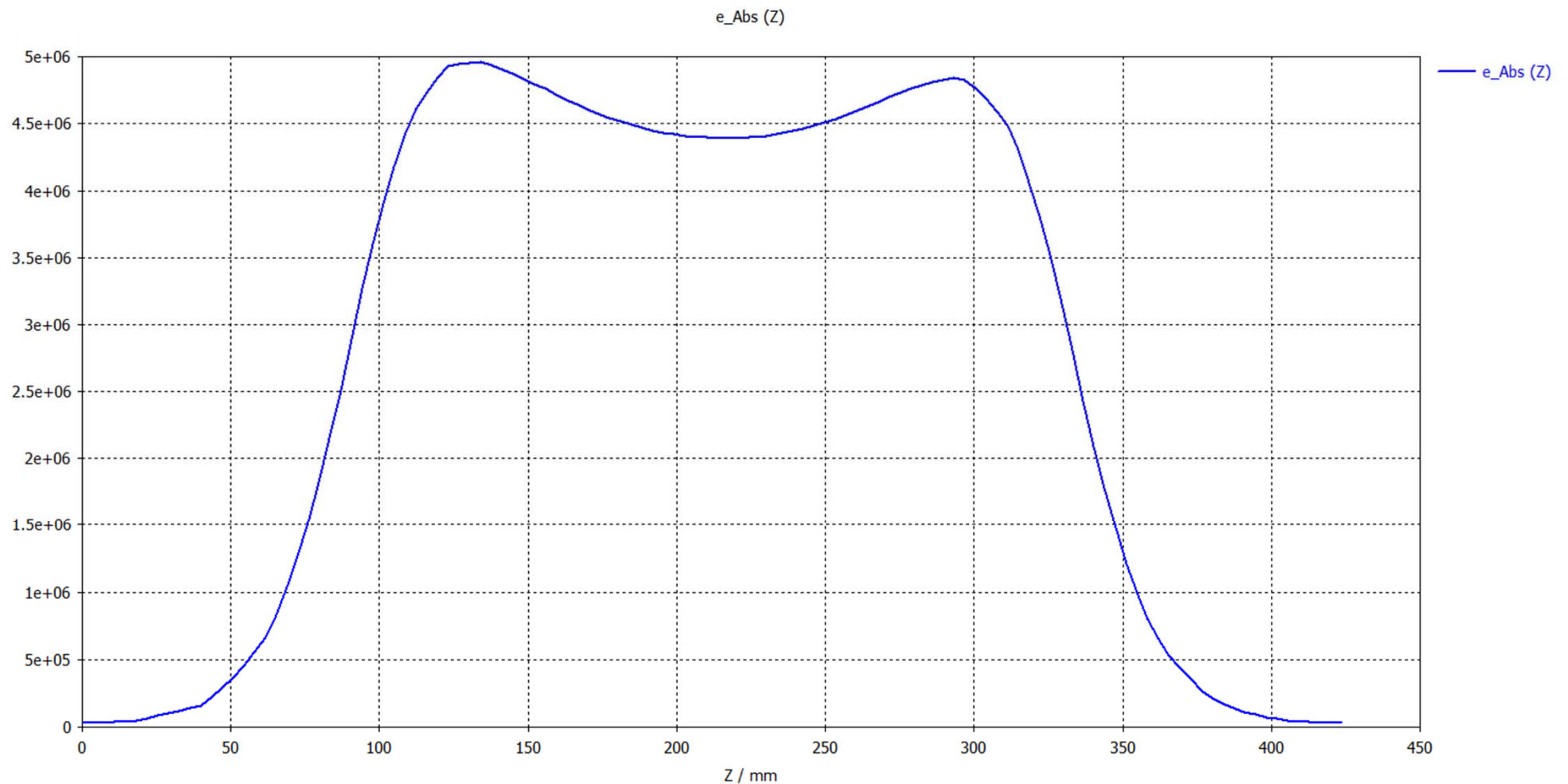
Shift of electrical axis in 500 MHz cavity

- Dependence of shift from tuner position

Tuning plunger of 500 MHz cavity

- Field penetration at the tuner gap
- Surface current with contact springs and without

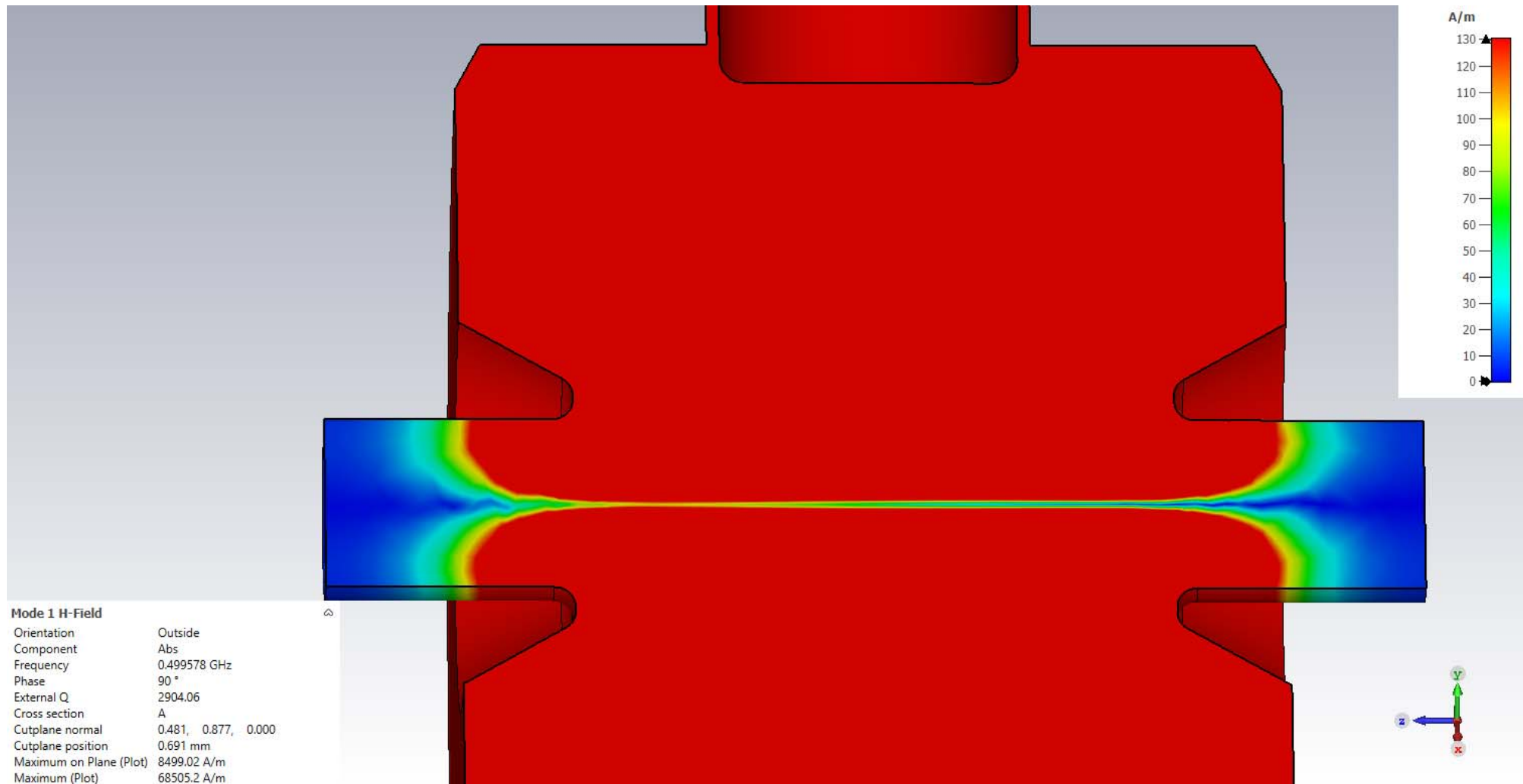
Fundamental Mode E Field on Axis



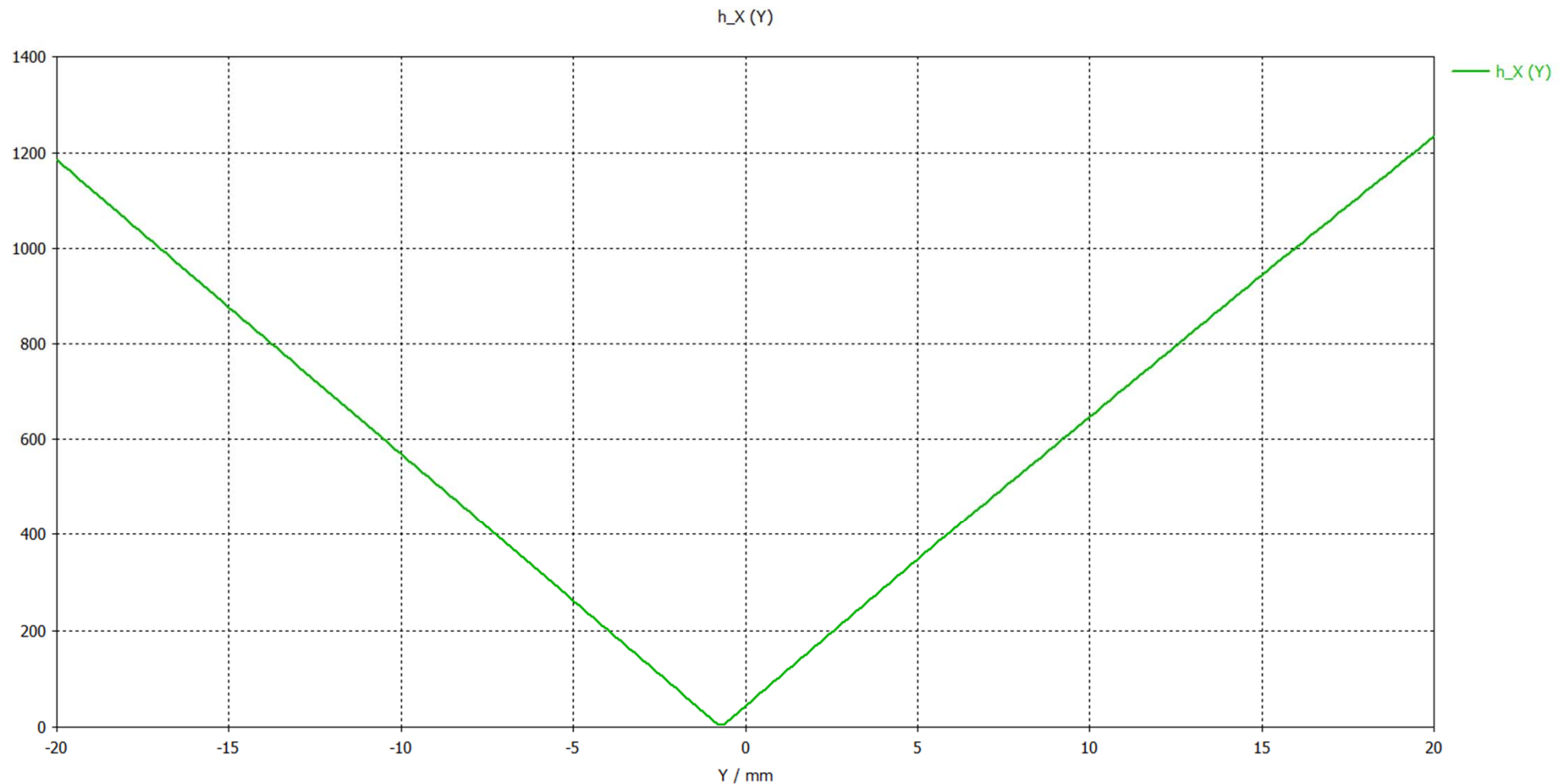
Electrical Axis of Fundamental Mode



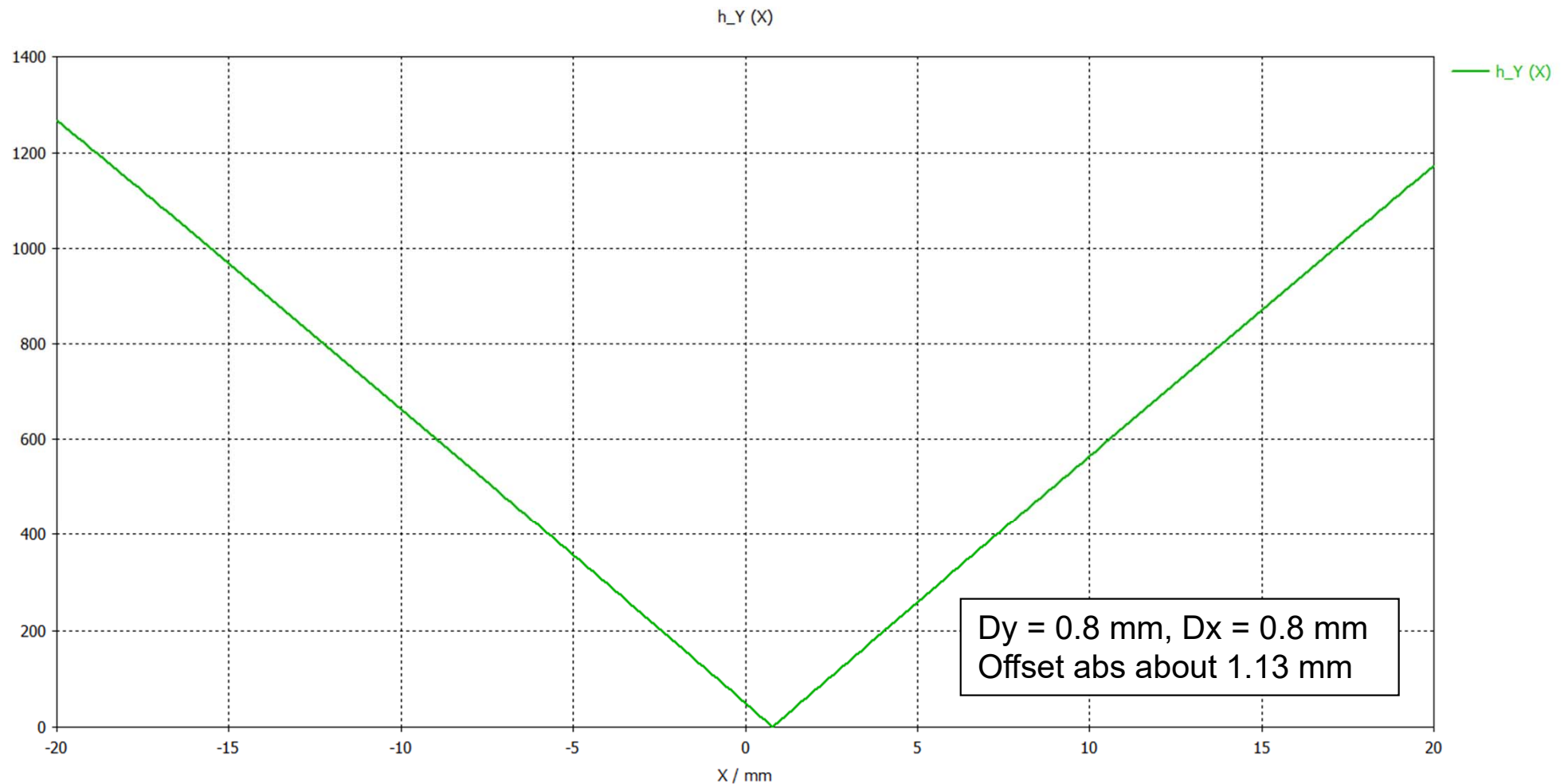
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Tuner at $t_u = 30$ mm ($H_x(y)$)



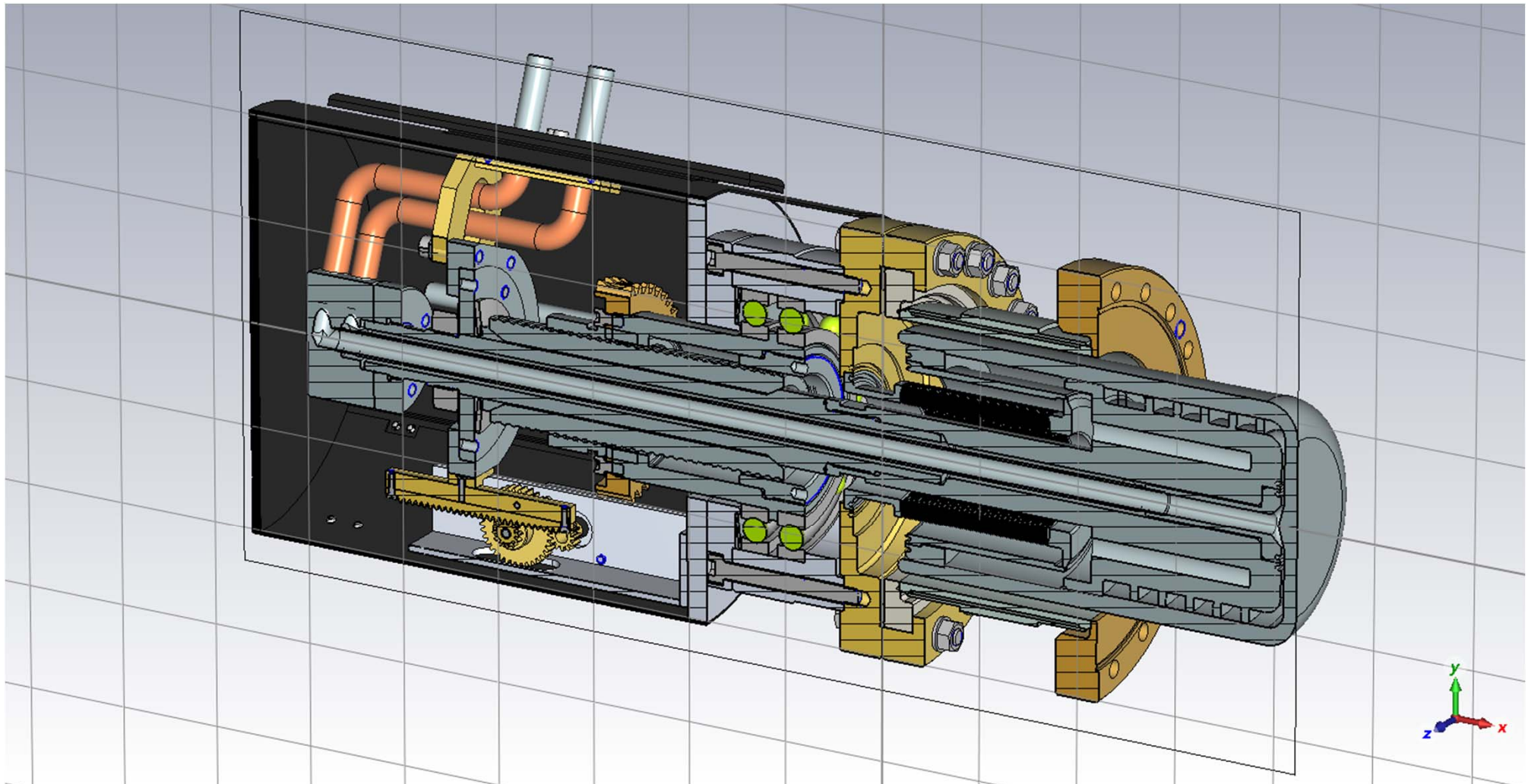
Tuner at $t_u = 30$ mm ($H_y(x)$)



New Tuner for PETRA IV 500 MHz Cavity



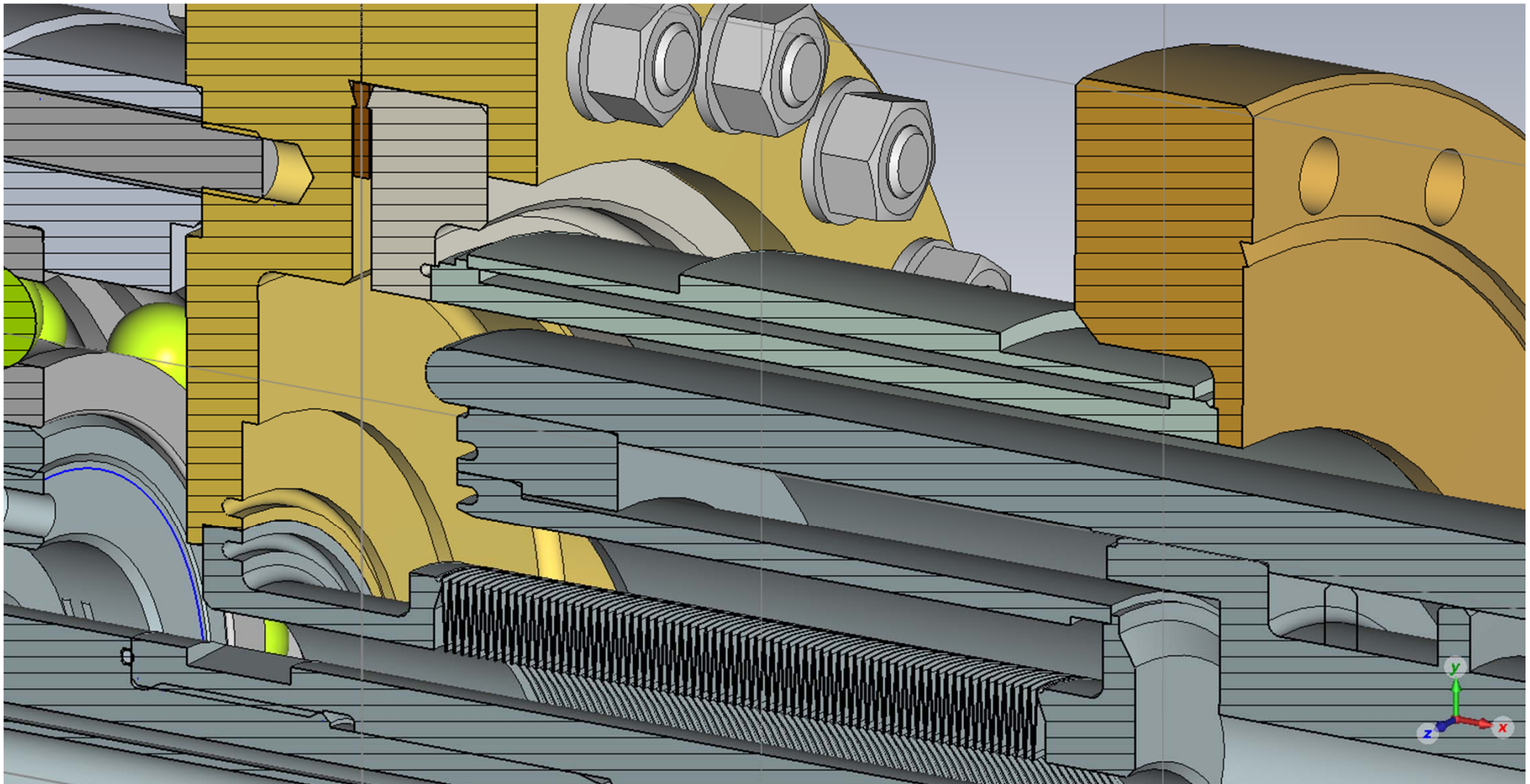
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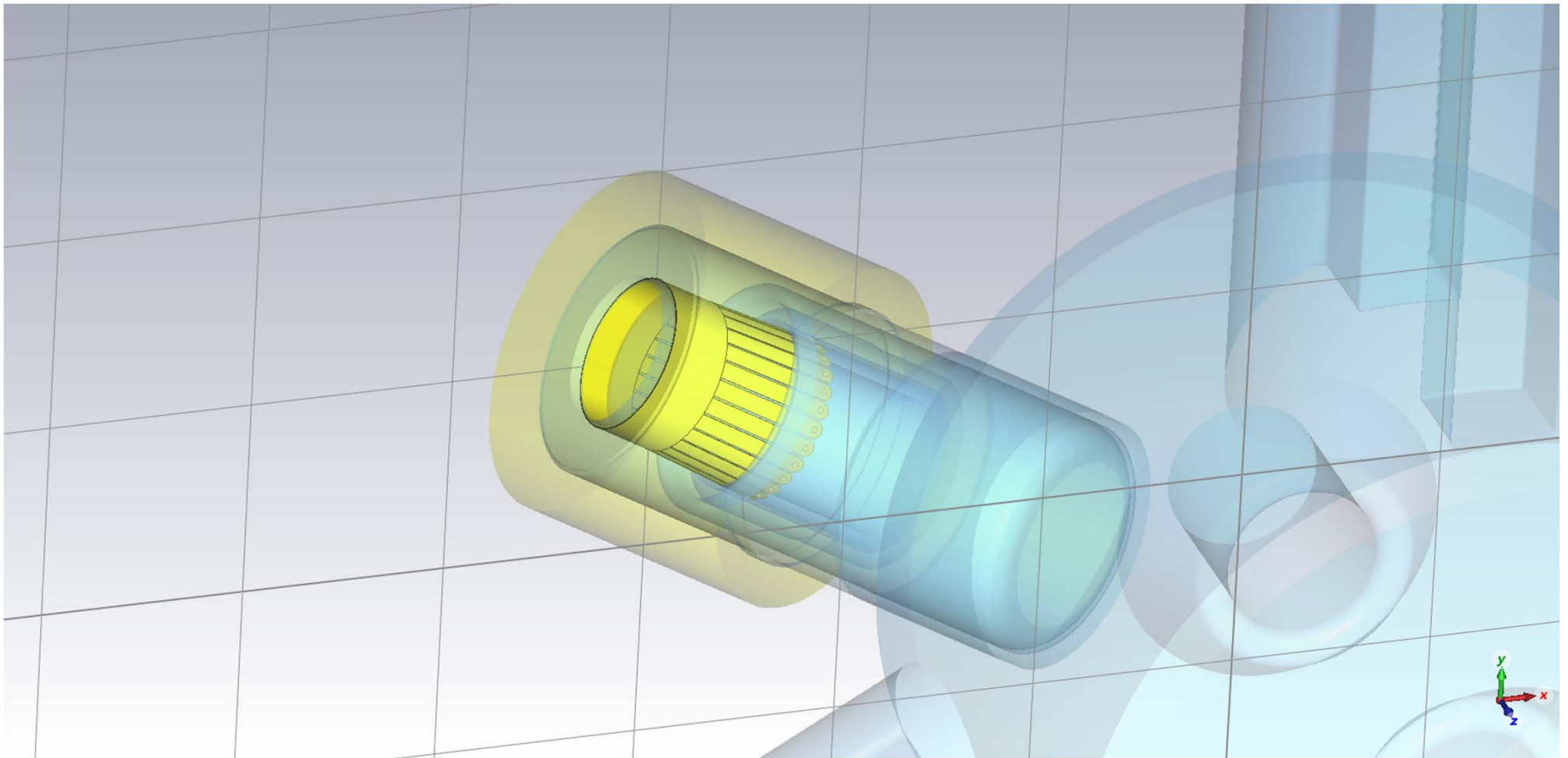
New Tuner without Contact Springs



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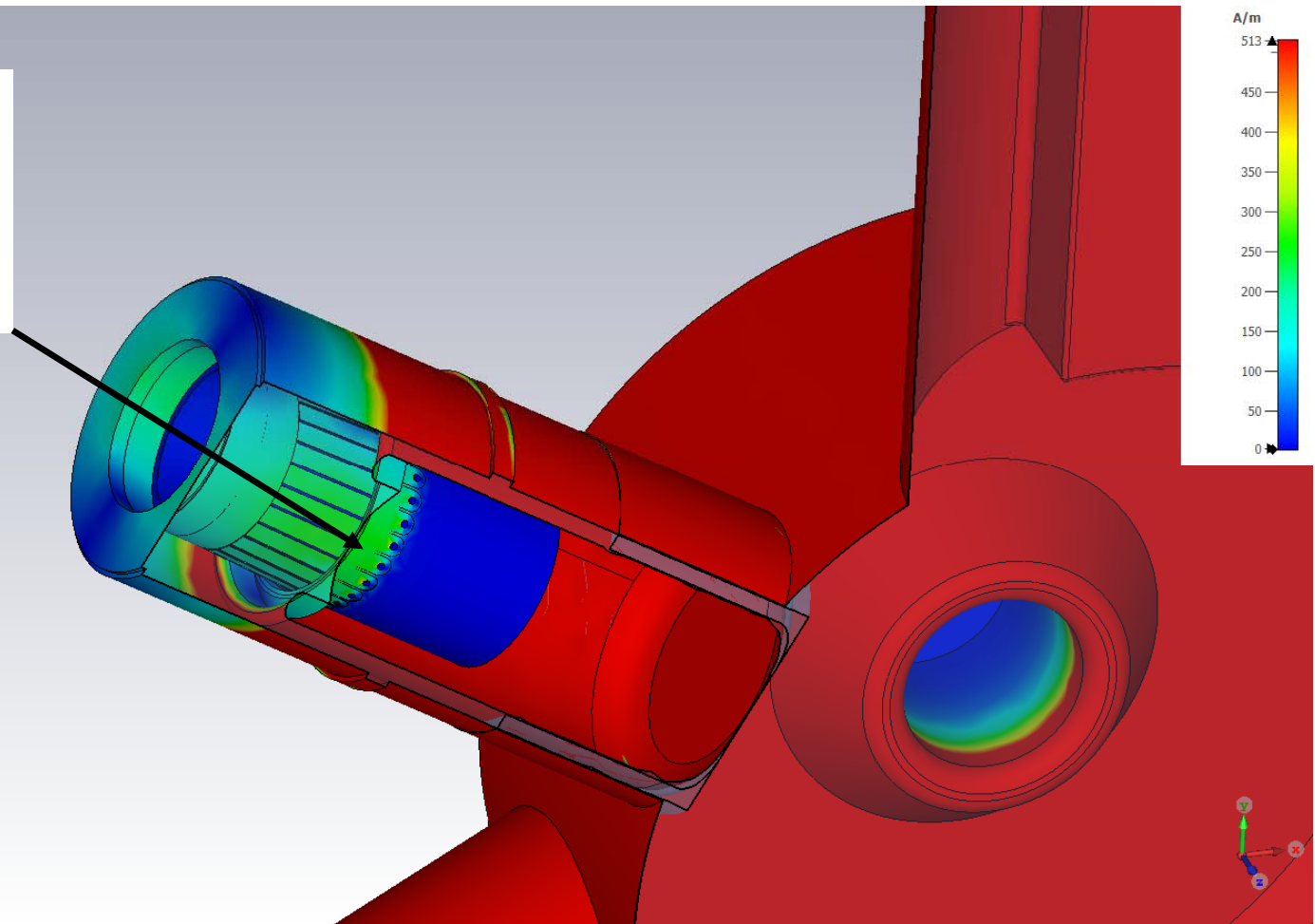
Inner Part of the Tuner



Surface Current on Contact Springs



Surface Current
max. 137 A/m
for Cavity Voltage
of 470 kV ($\beta = \text{inf.}$)

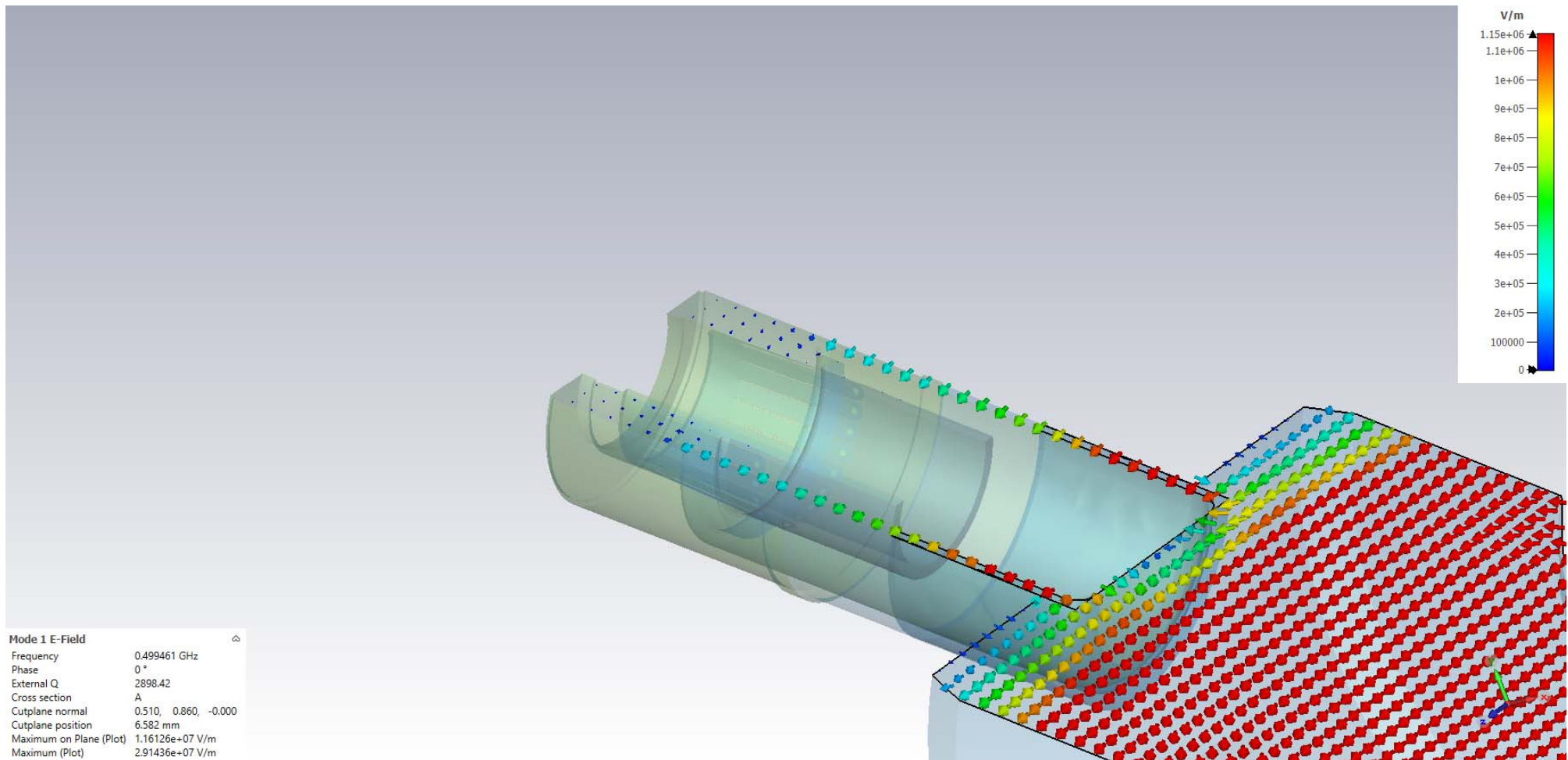


Mode 1 Surface Current
Component Abs
Frequency 0.499461 GHz
Phase 90 °
External Q 2898.42
Maximum (Plot) 155631 A/m

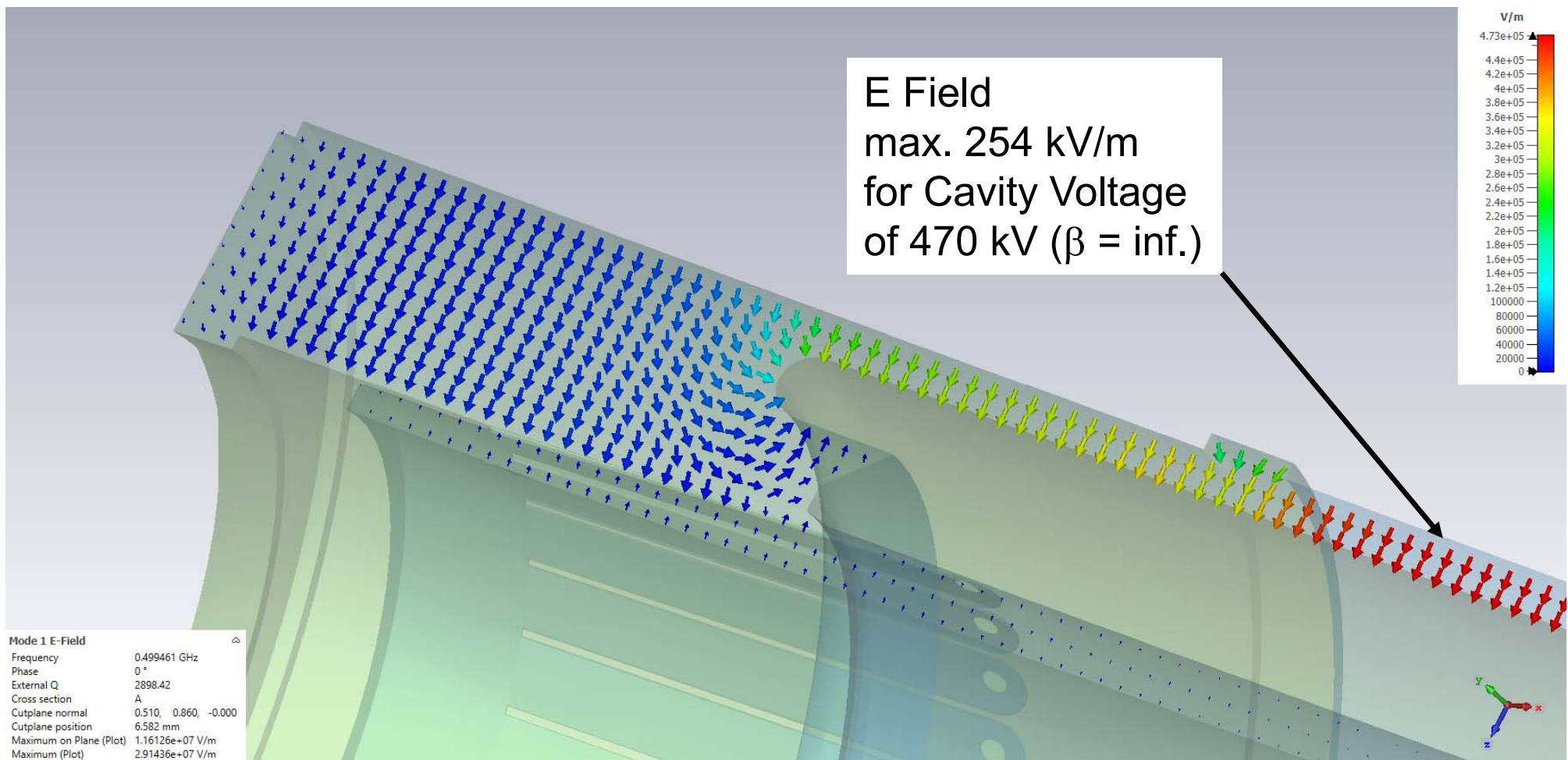
E Field in Tuner Gap



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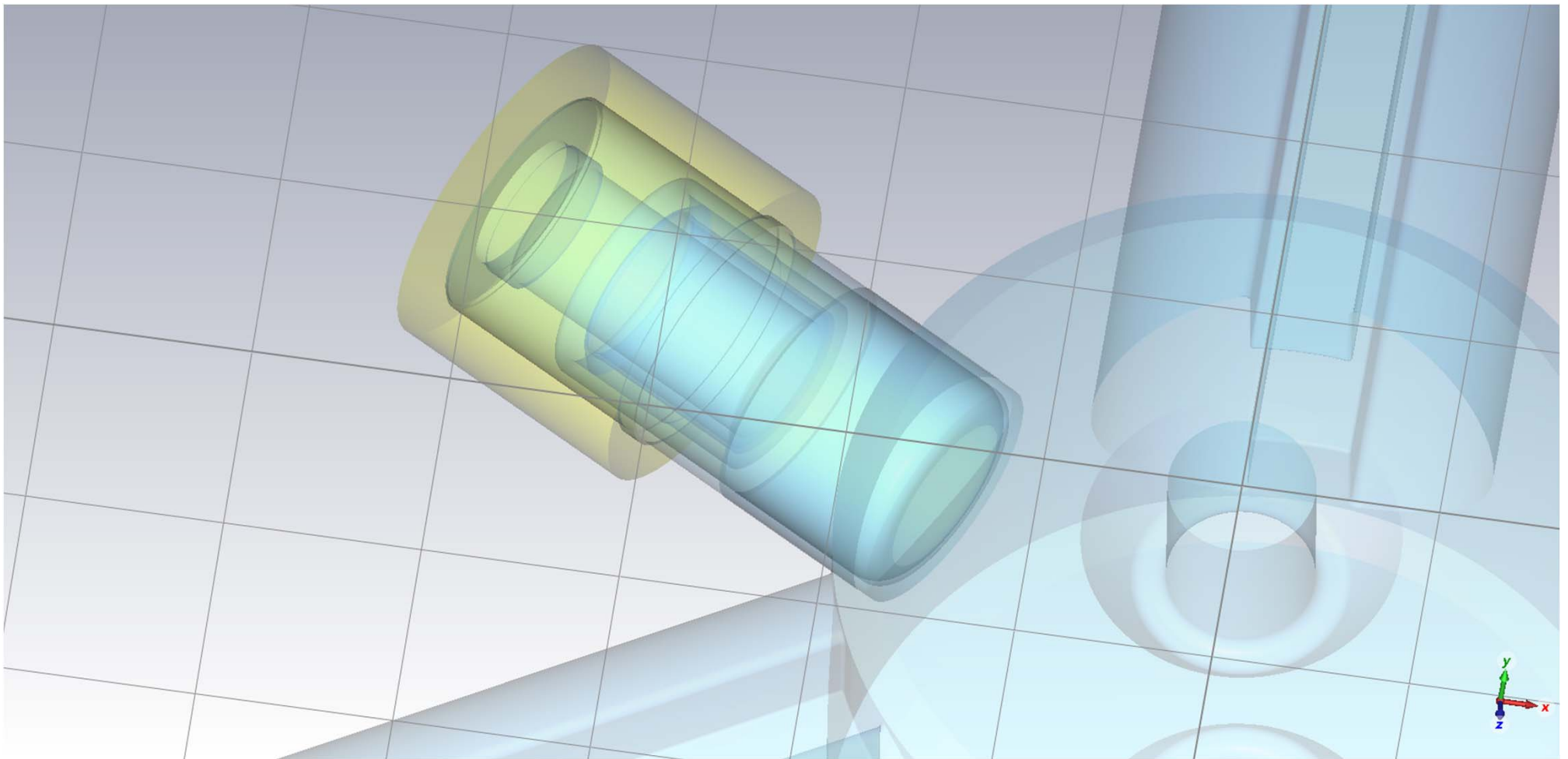
E Field in Tuner Gap (Contact Springs)



Tuner without Contact Springs



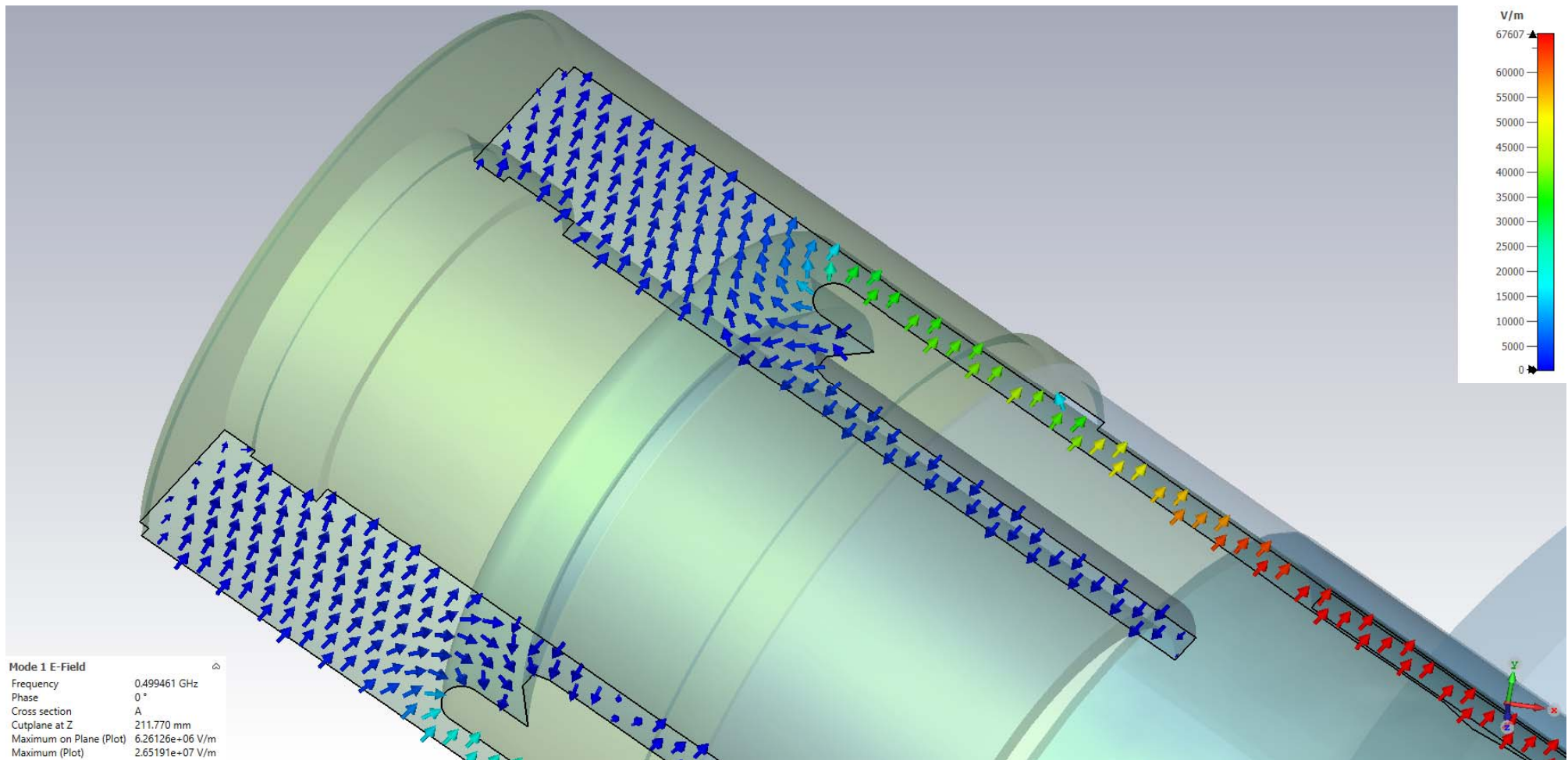
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E Field without Contact Springs



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Surface Current on Bellow



Surface Current
max. 137 A/m
for Cavity Voltage
of 470 kV ($\beta = \text{inf.}$)

