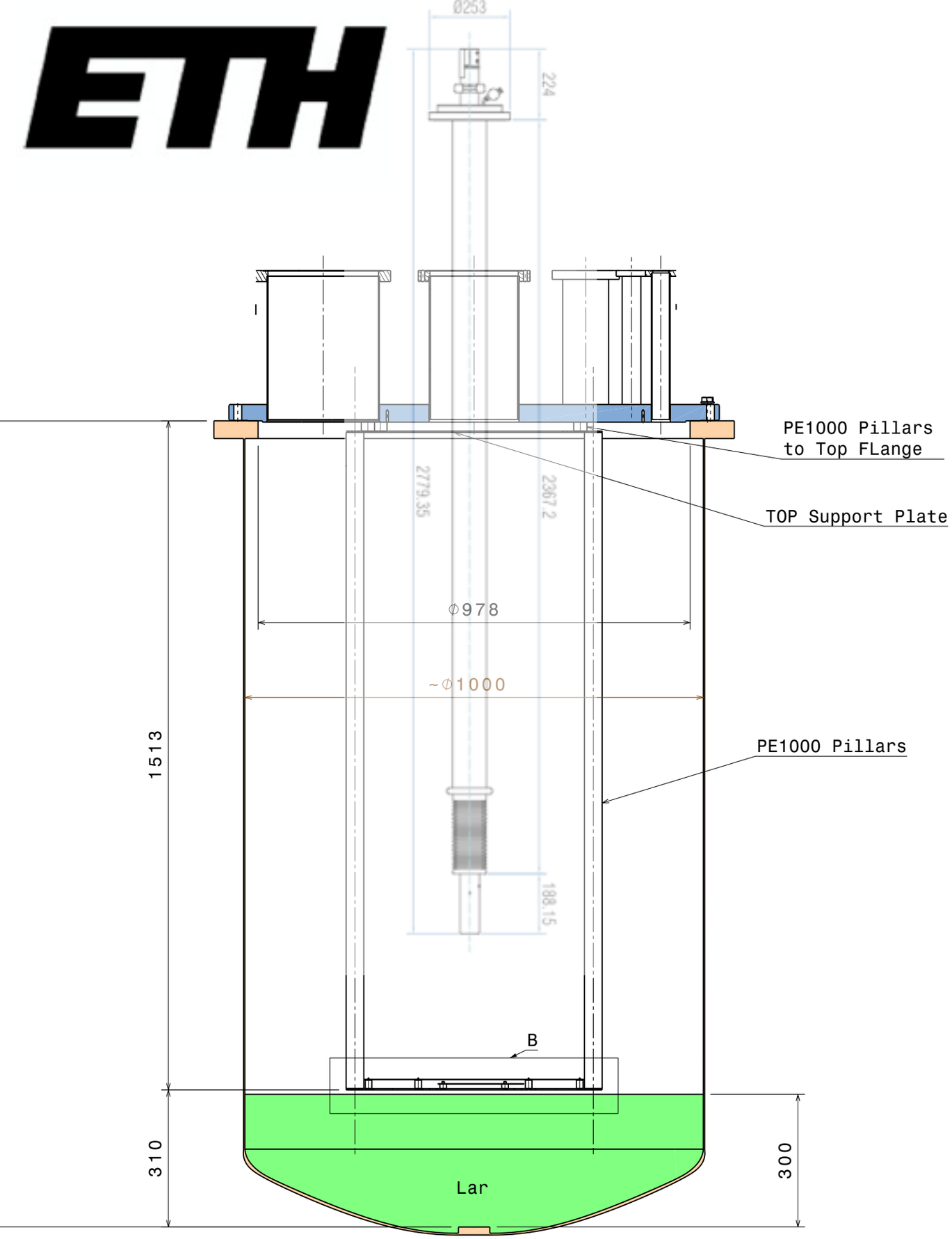
ETH

WA105

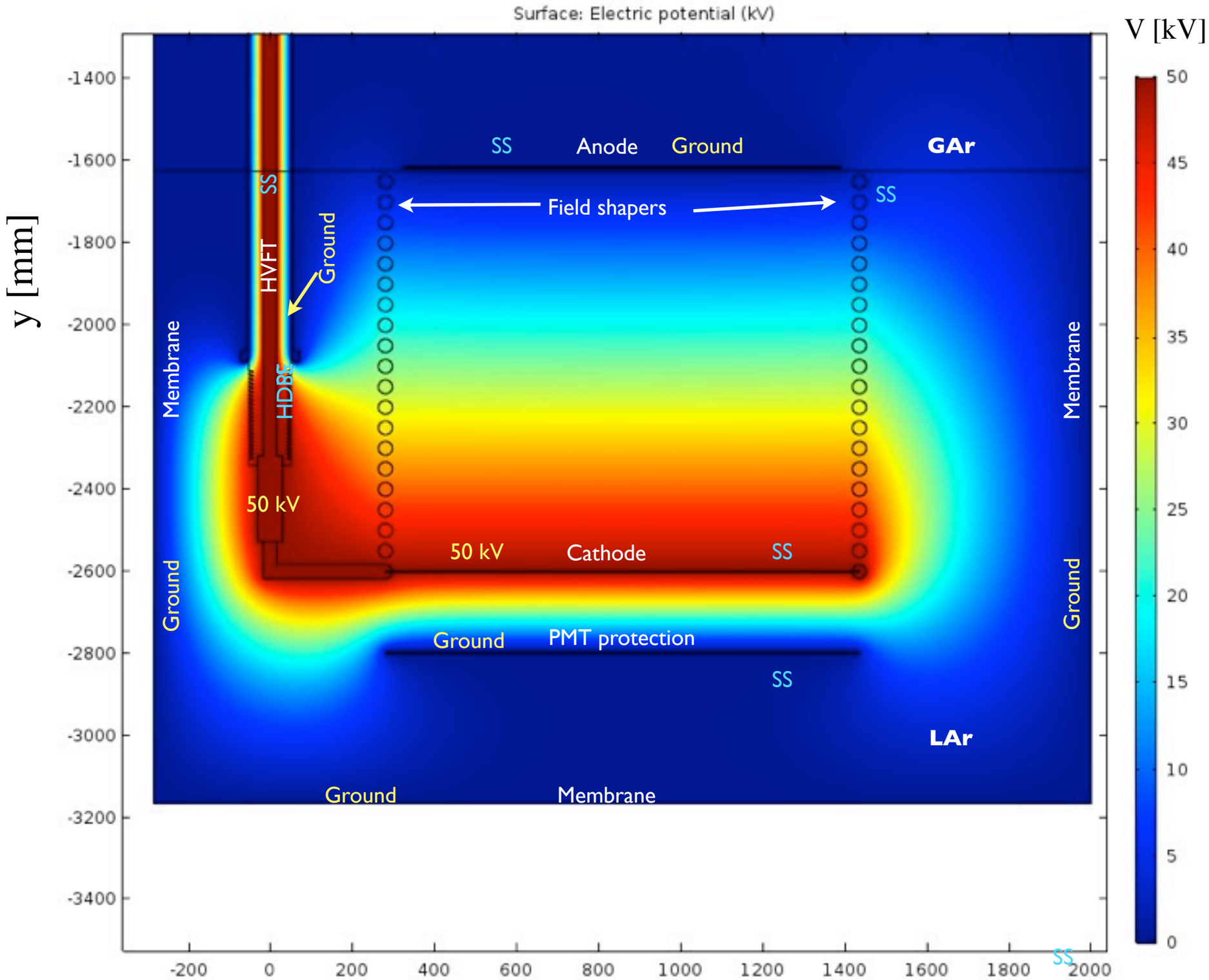


Status of HVFT simulations

Adamo Gendotti
Franco Sergiampietri
Laura Molina Bueno

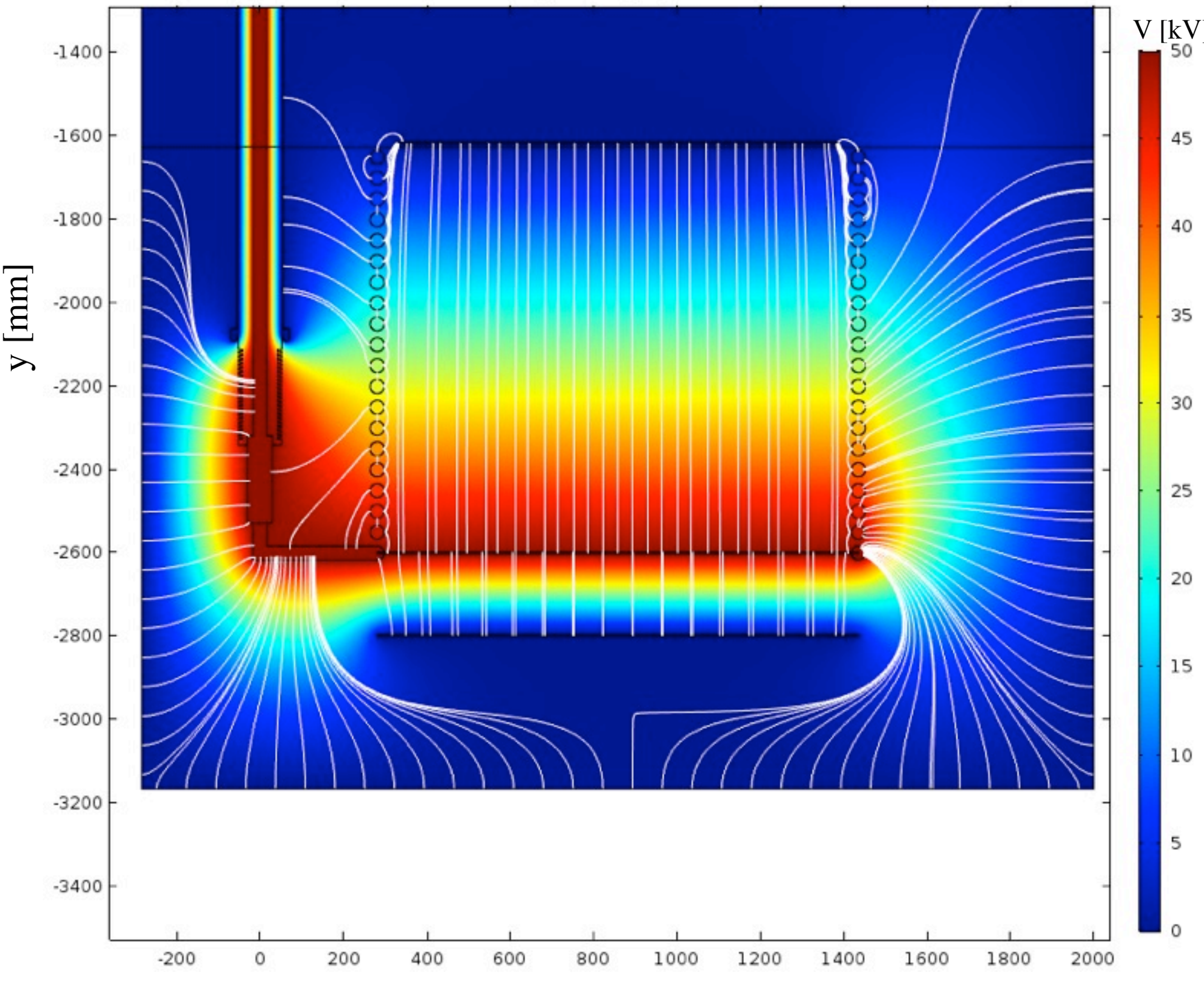
Work in progress!!

➤ **Goal:** Full simulation of the field along the 3x1x1 setup



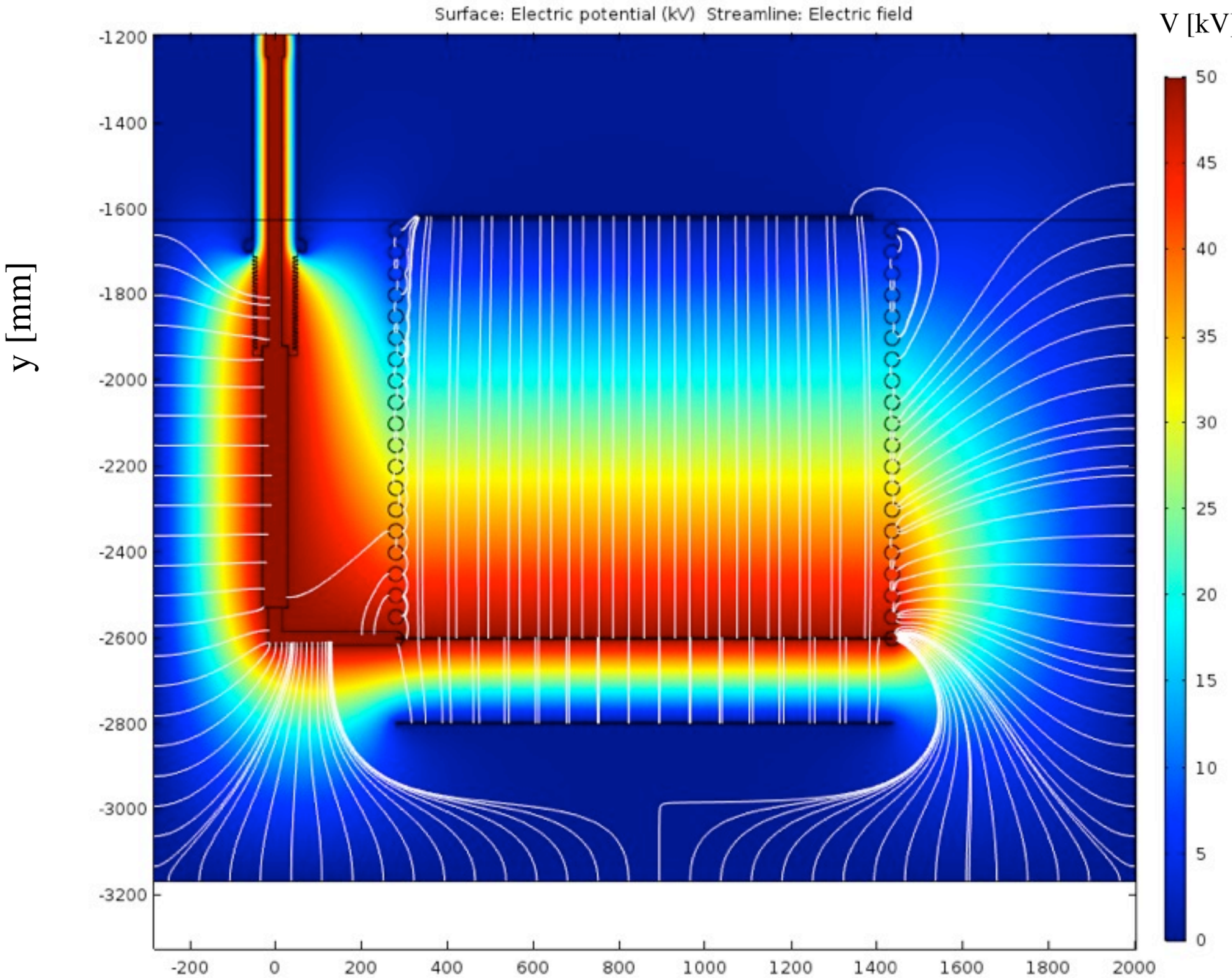
Surface: Electric potential (kV) Streamline: Electric field

Preliminary!!

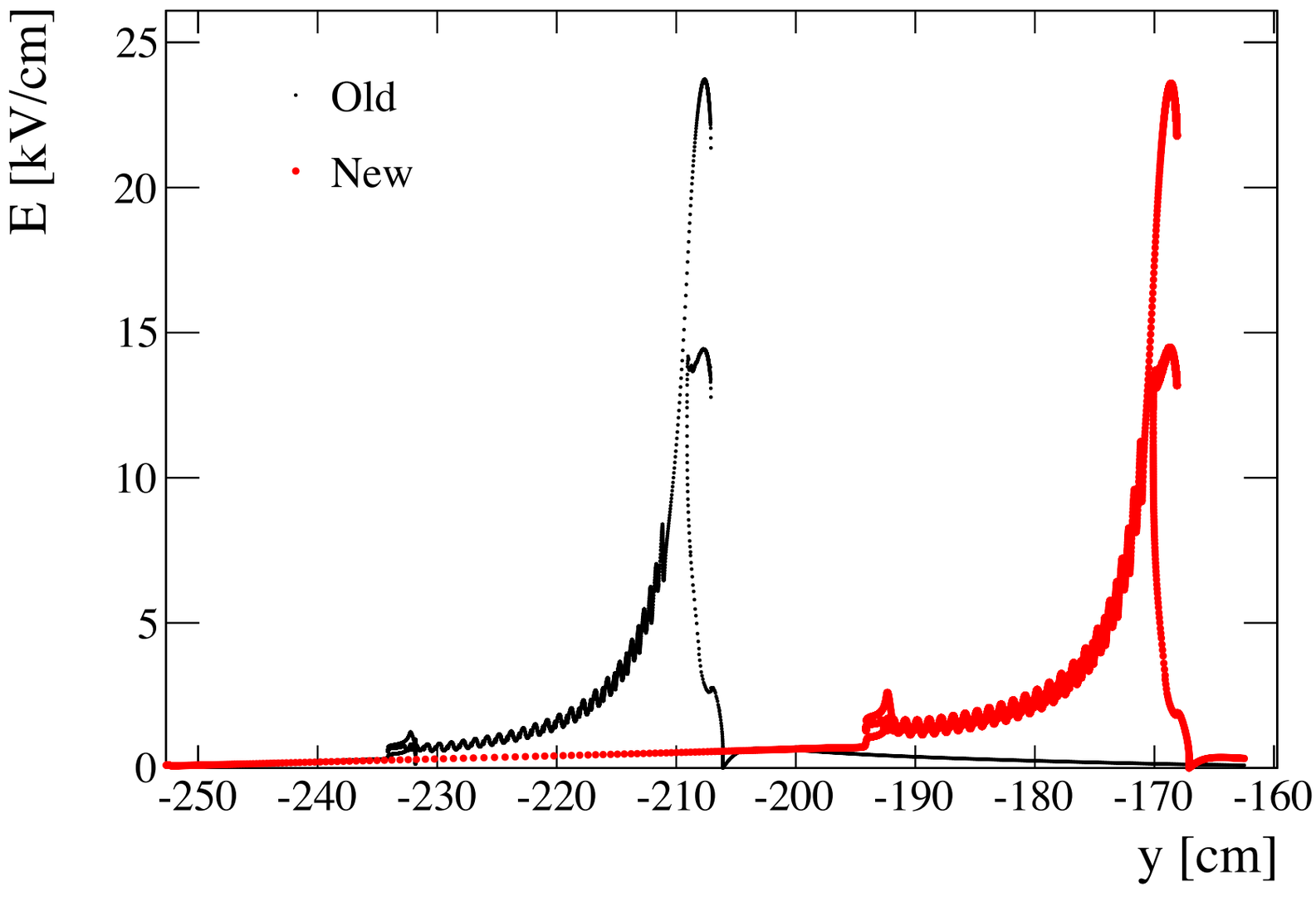


➤ Simulations including the new HVFT design

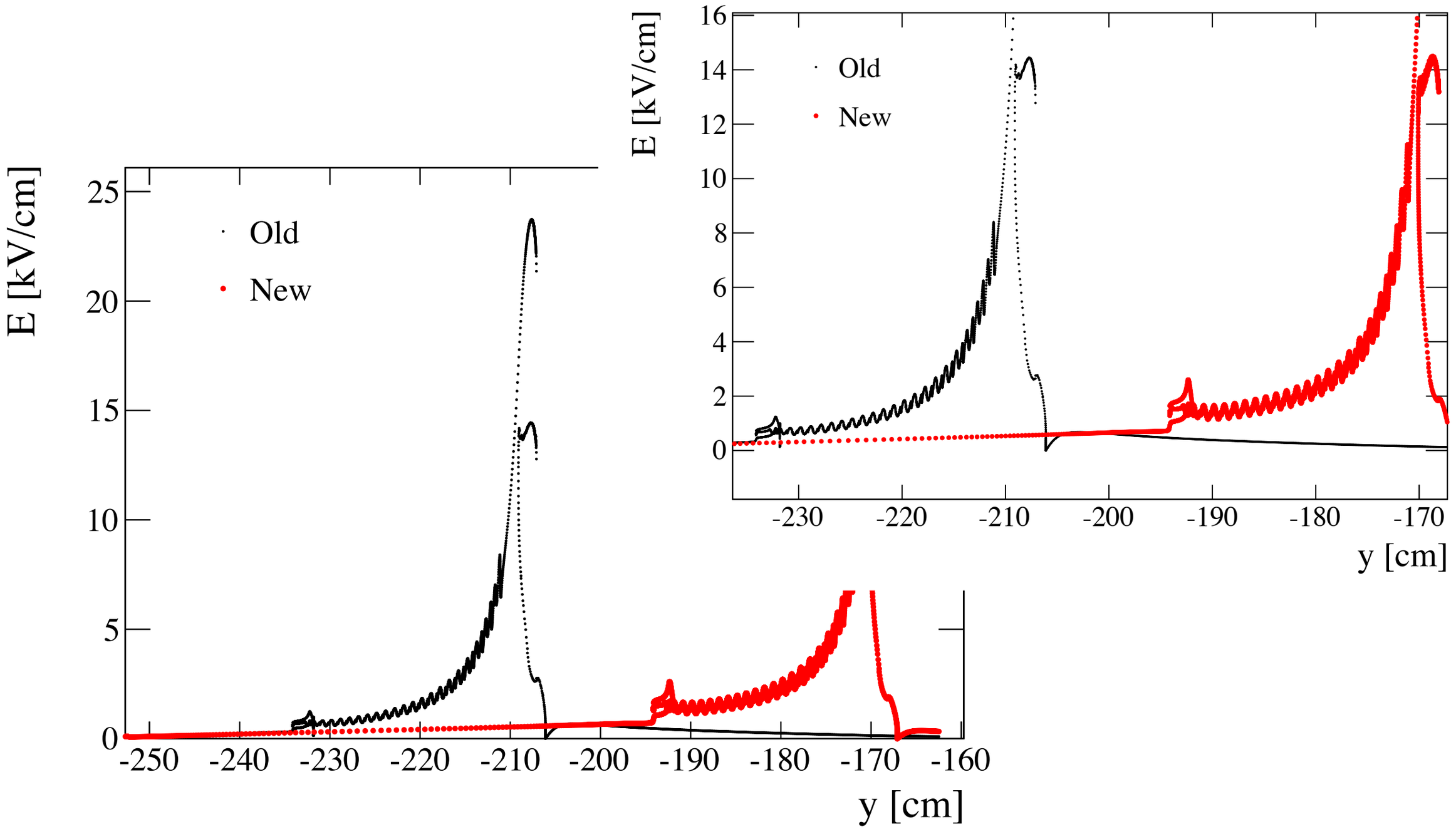
Preliminary!!

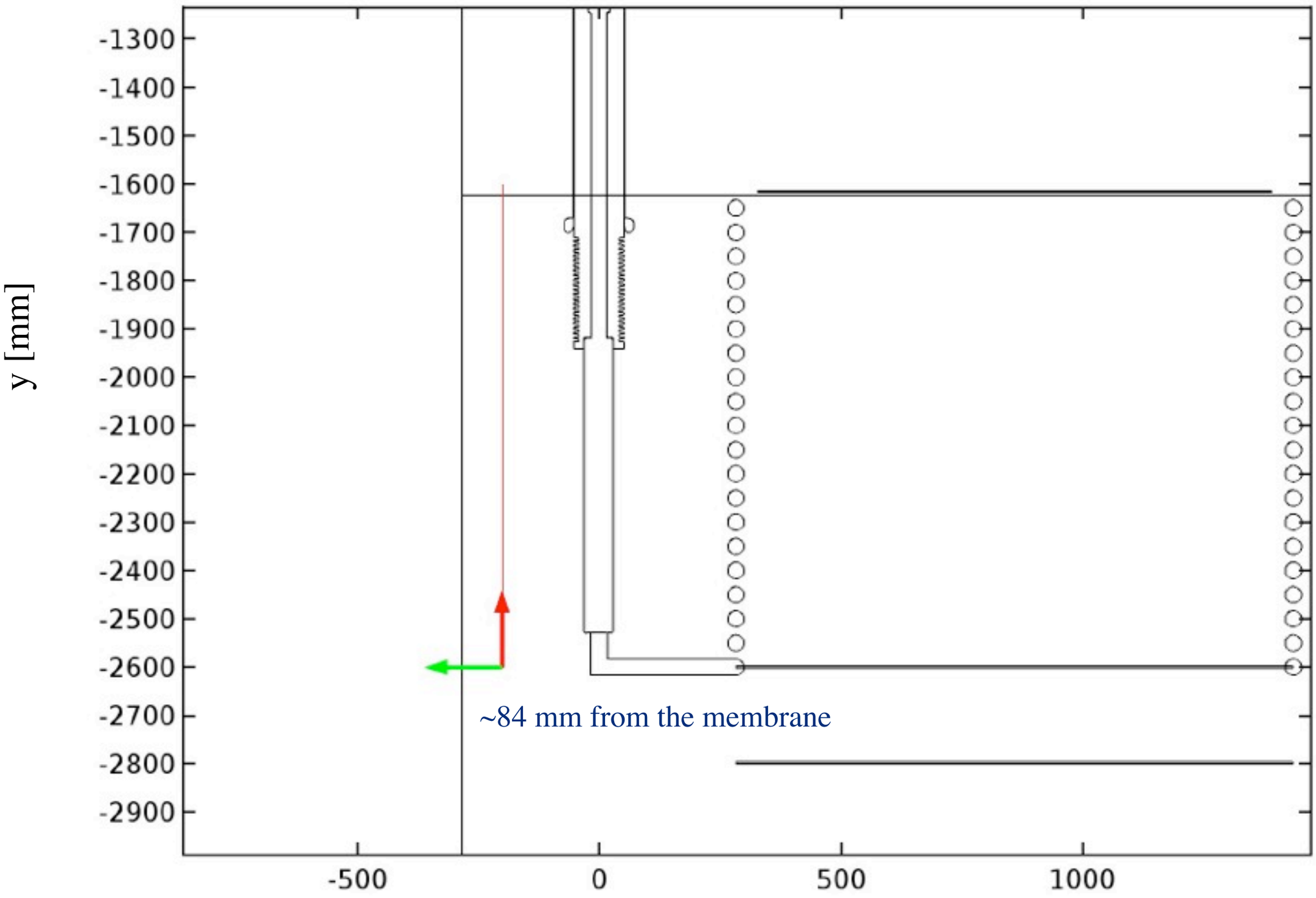


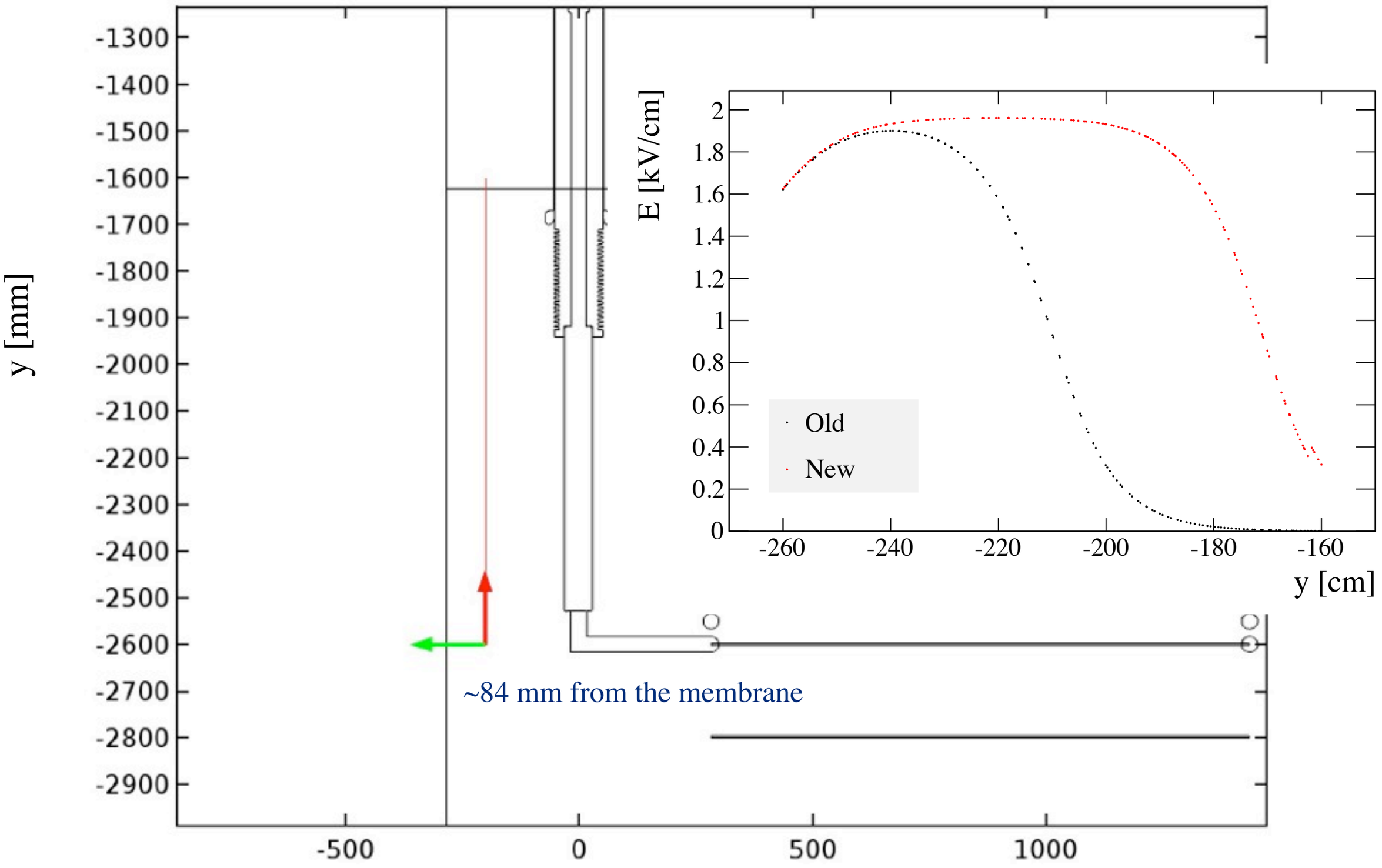
Computed electric field on the profile of the *HVFT* as a function of the distance z

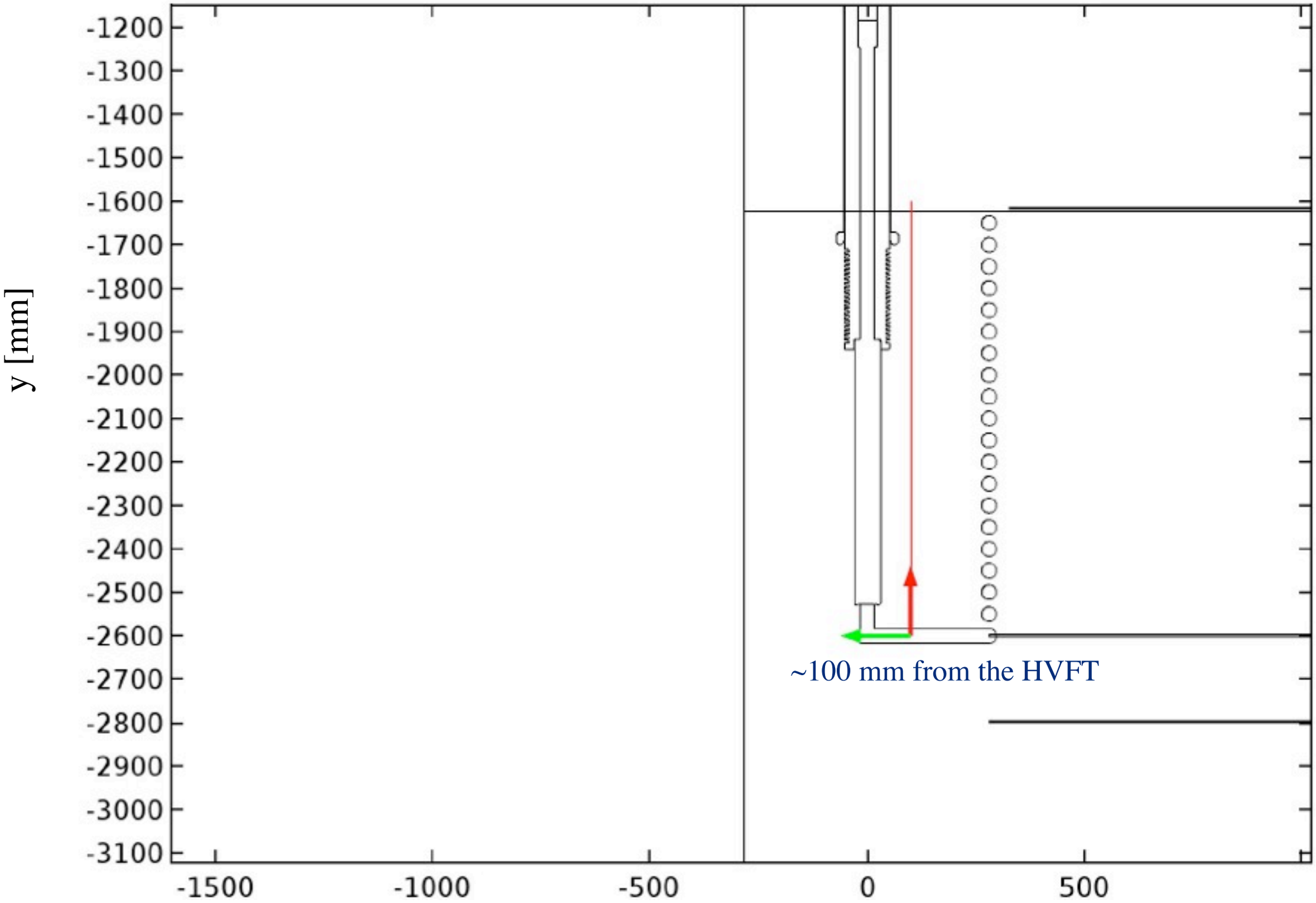


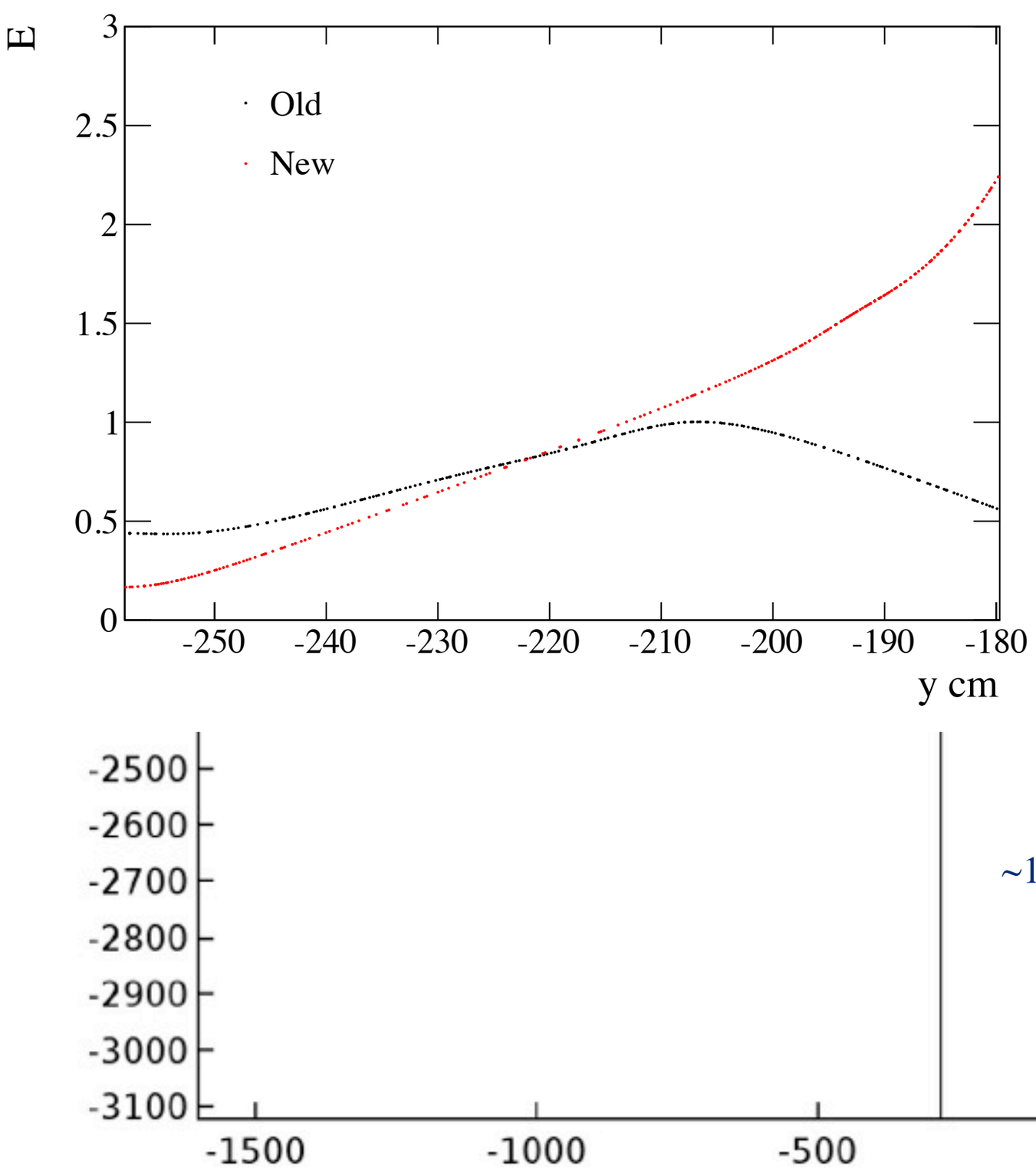
Computed electric field on the profile of the *HVFT* as a function of the distance z

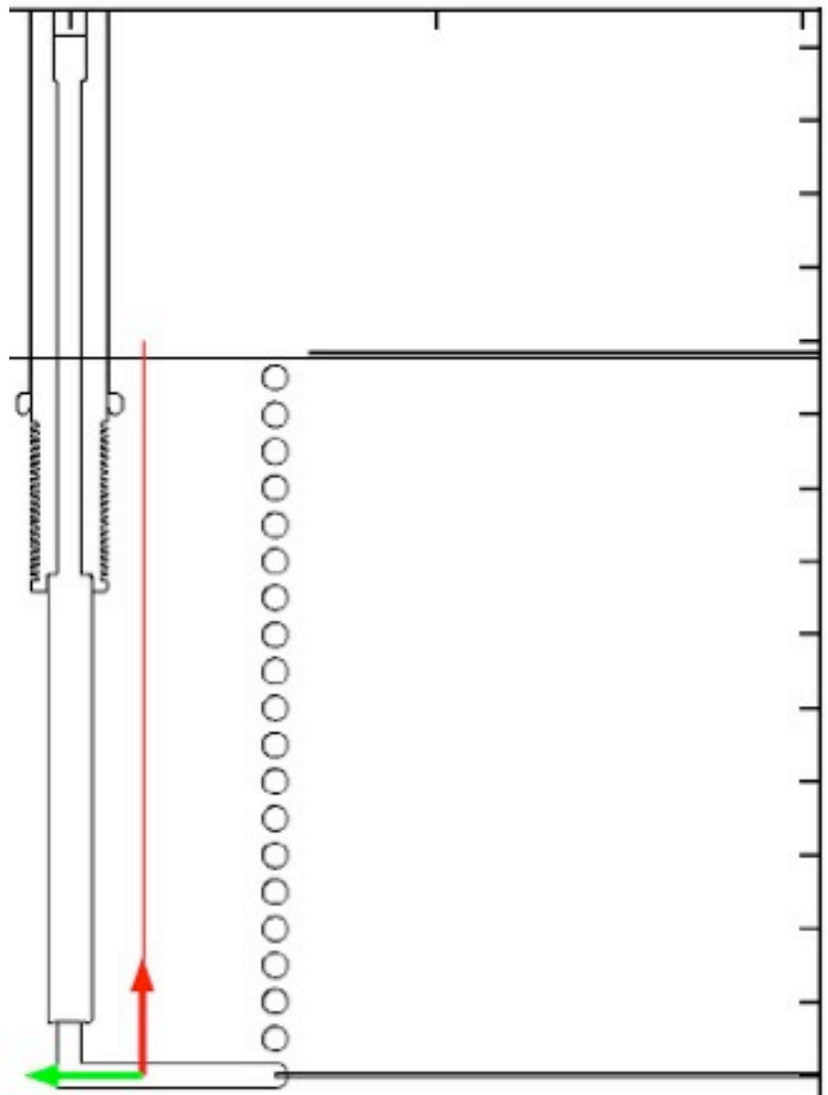


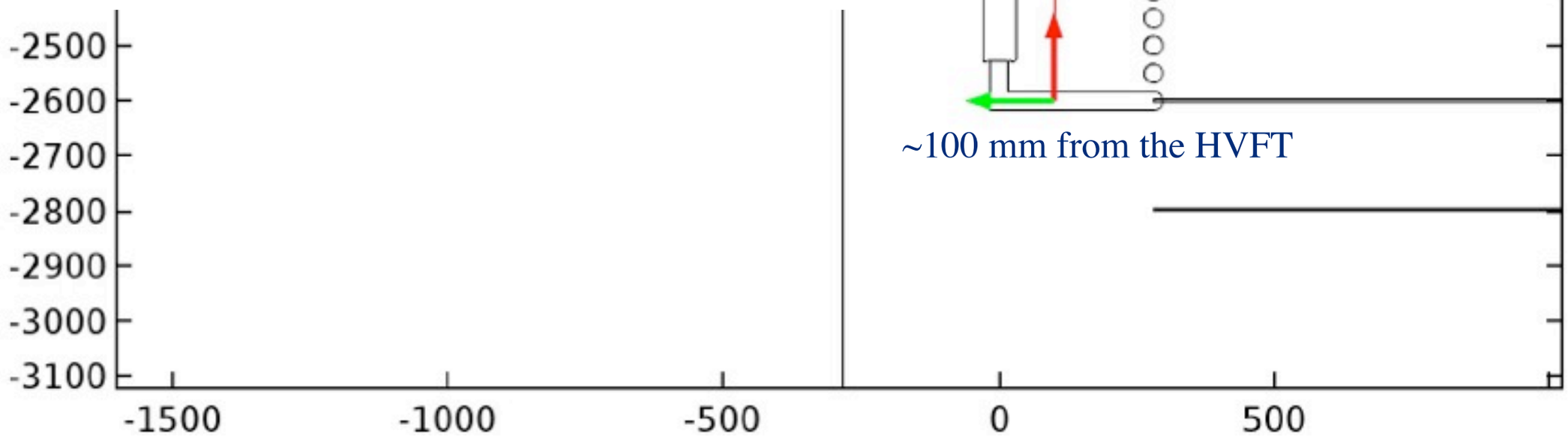

y [mm]
-1300
-1400
-1500
-1600
-1700
-1800
-1900
-2000
-2100
-2200
-2300
-2400
-2500
-2600
-2700
-2800
-2900
-500
0
500
1000
~84 mm from the membrane
x [mm]

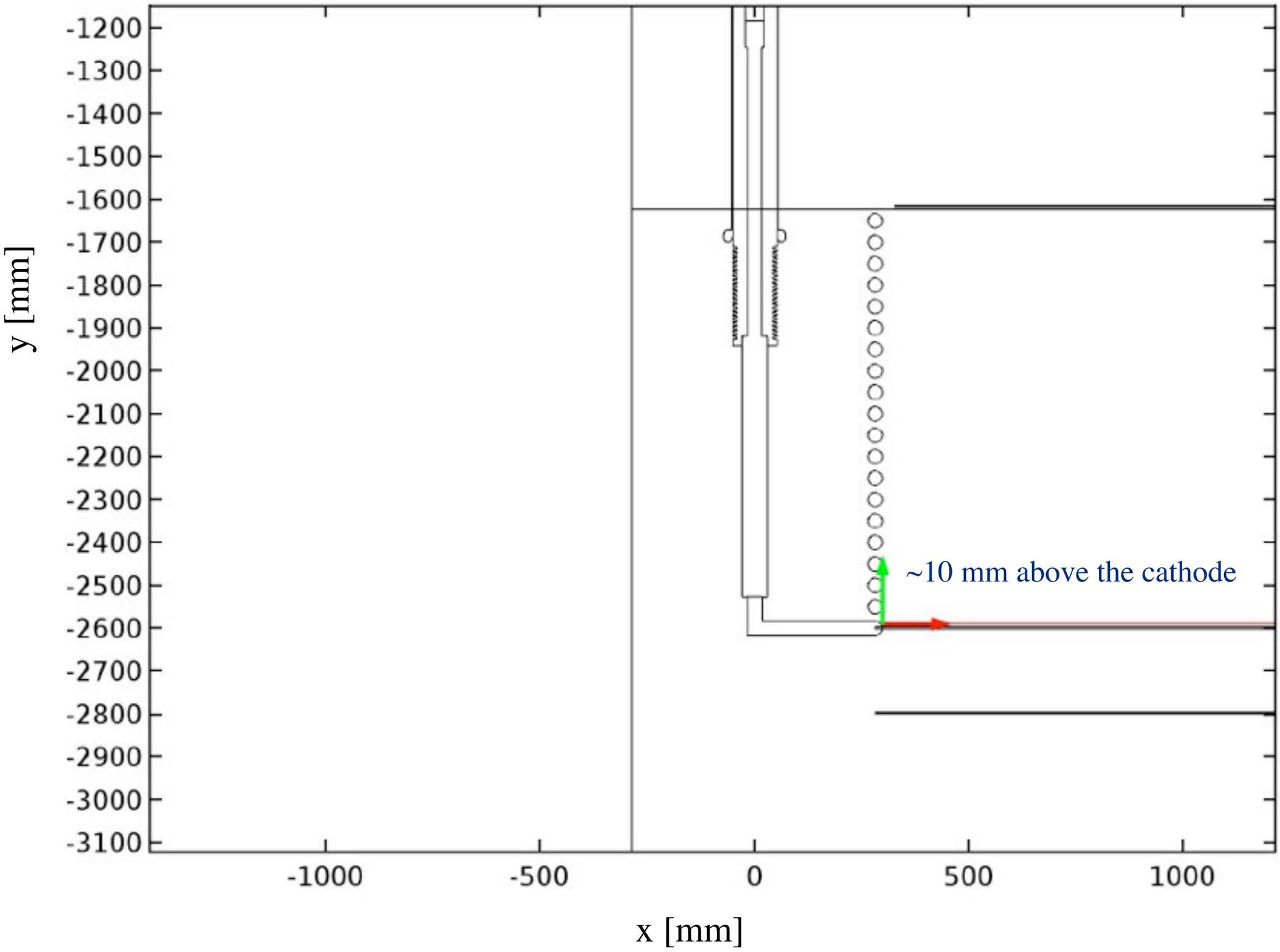

y [mm]
-1300
-1400
-1500
-1600
-1700
-1800
-1900
-2000
-2100
-2200
-2300
-2400
-2500
-2600
-2700
-2800
-2900
-500
0
500
1000
x [mm]
~84 mm from the membrane
E [kV/cm]
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Old
New
-260
-240
-220
-200
-180
-160
y [cm]

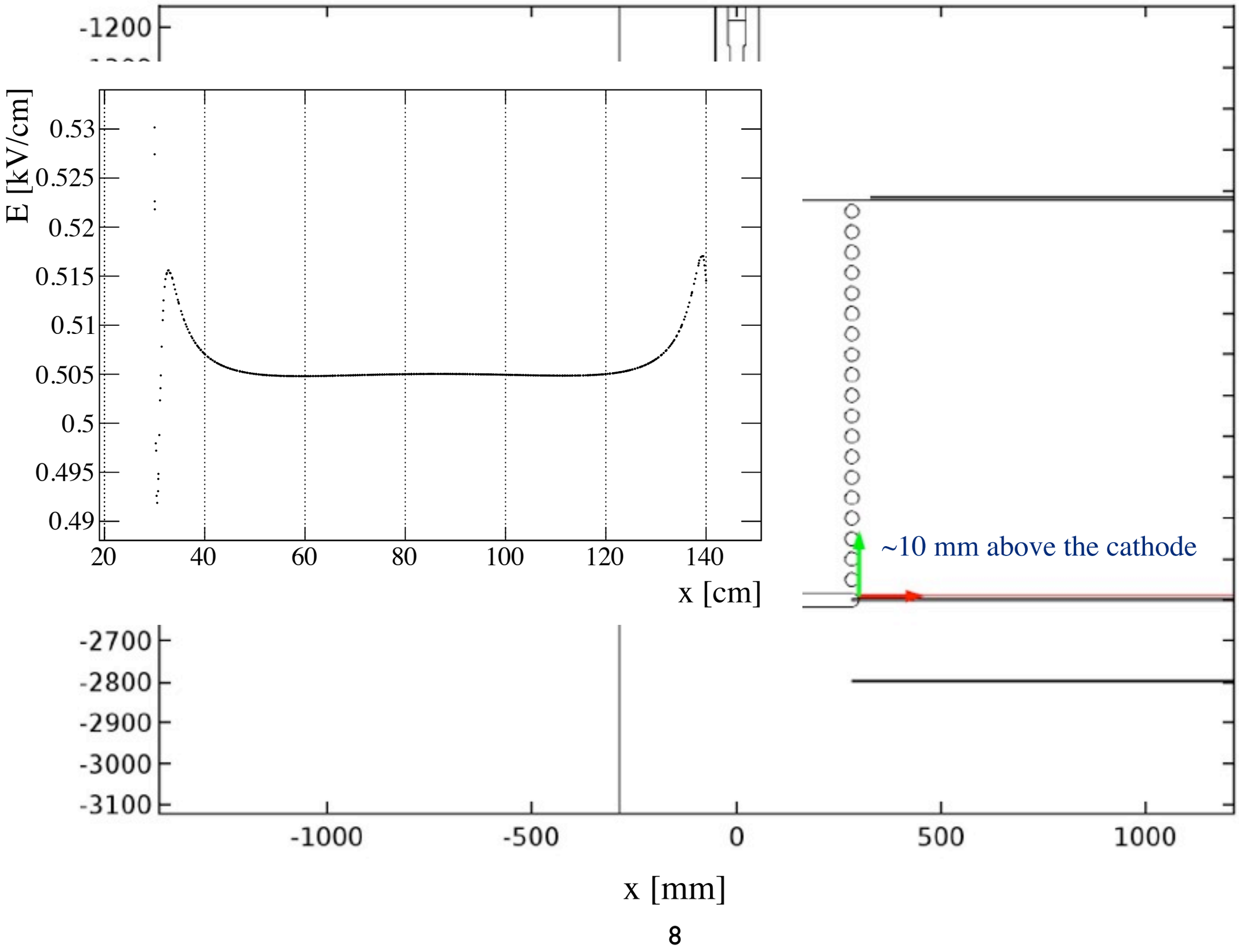

y [mm]
-1200
-1300
-1400
-1500
-1600
-1700
-1800
-1900
-2000
-2100
-2200
-2300
-2400
-2500
-2600
-2700
-2800
-2900
-3000
-3100
-1500
-1000
-500
0
500
x [mm]
~100 mm from the HVFT


E
Old
New
3
2.5
2
1.5
1
0.5
0
-250
-240
-230
-220
-210
-200
-190
-180
y cm

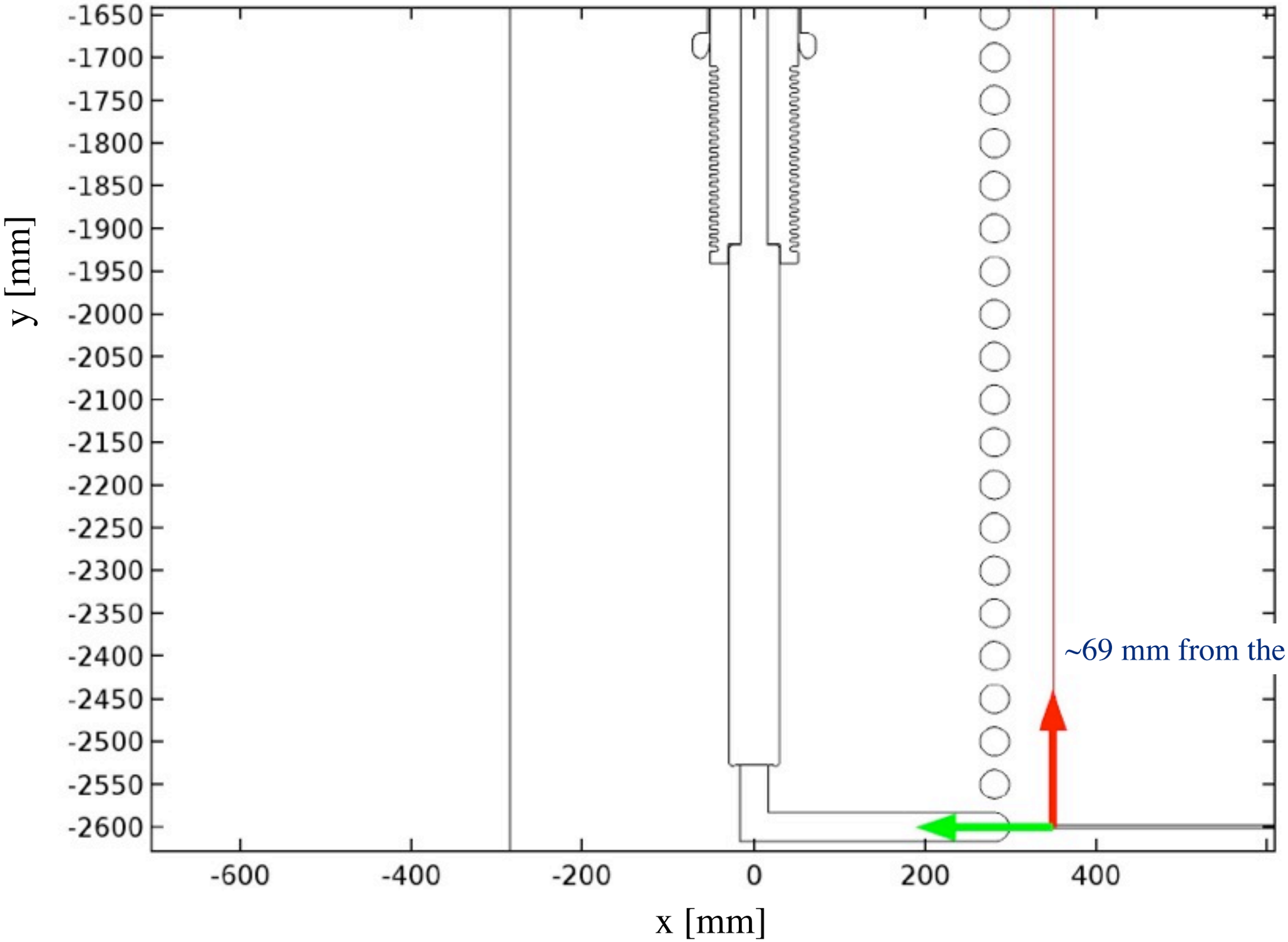

~100 mm from the HVFT


-2500
-2600
-2700
-2800
-2900
-3000
-3100
-1500
-1000
-500
0
500
x [mm]

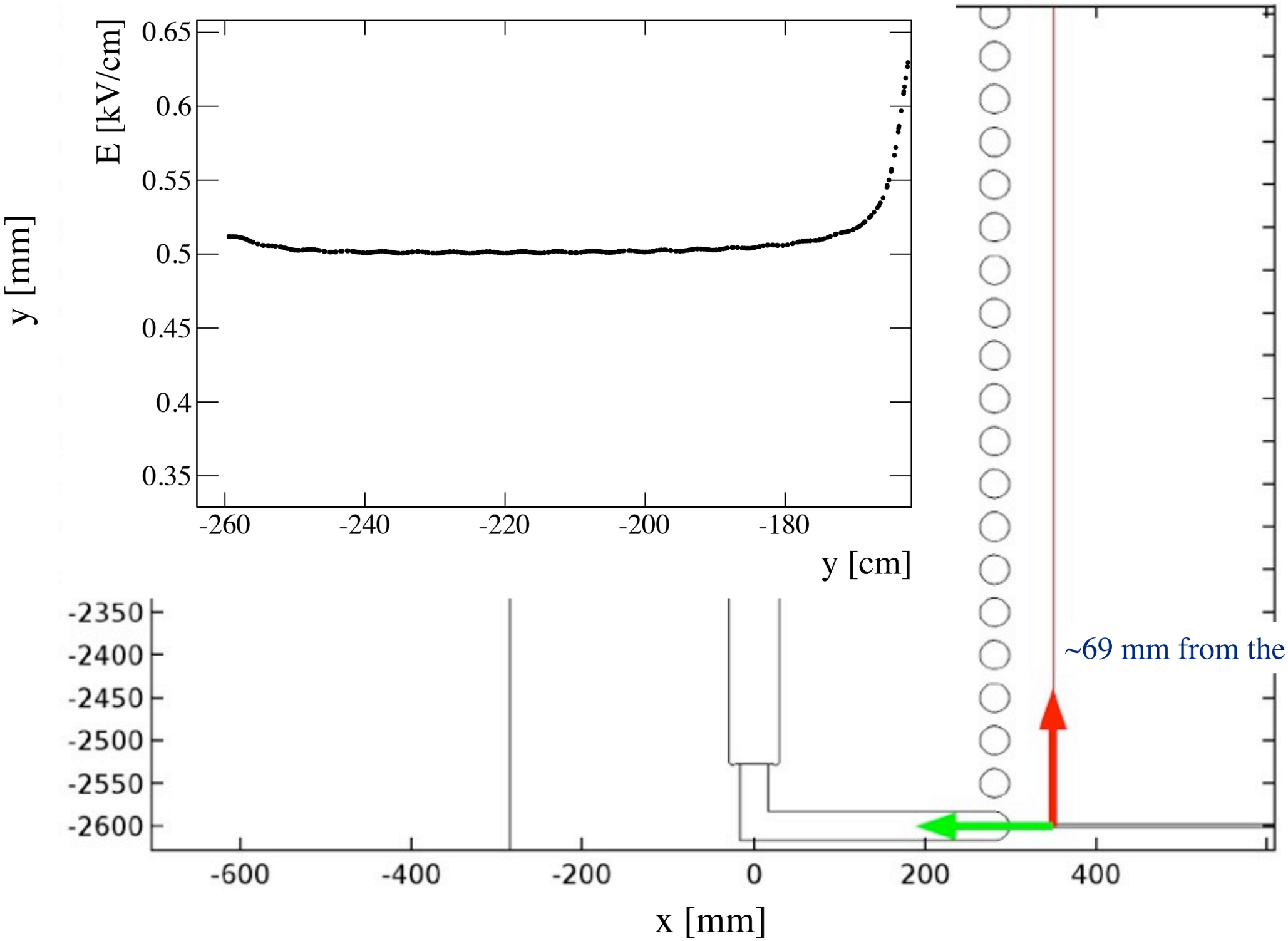

-1200
-1300
-1400
-1500
-1600
-1700
-1800
-1900
-2000
-2100
-2200
-2300
-2400
-2500
-2600
-2700
-2800
-2900
-3000
-3100
y [mm]
-1000
-500
0
500
1000
x [mm]
~10 mm above the cathode


-1200
E [kV/cm]
0.53
0.525
0.52
0.515
0.51
0.505
0.5
0.495
0.49
20
40
60
80
100
120
140
x [cm]
~10 mm above the cathode
-2700
-2800
-2900
-3000
-3100
-1000
-500
0
500
1000
x [mm]

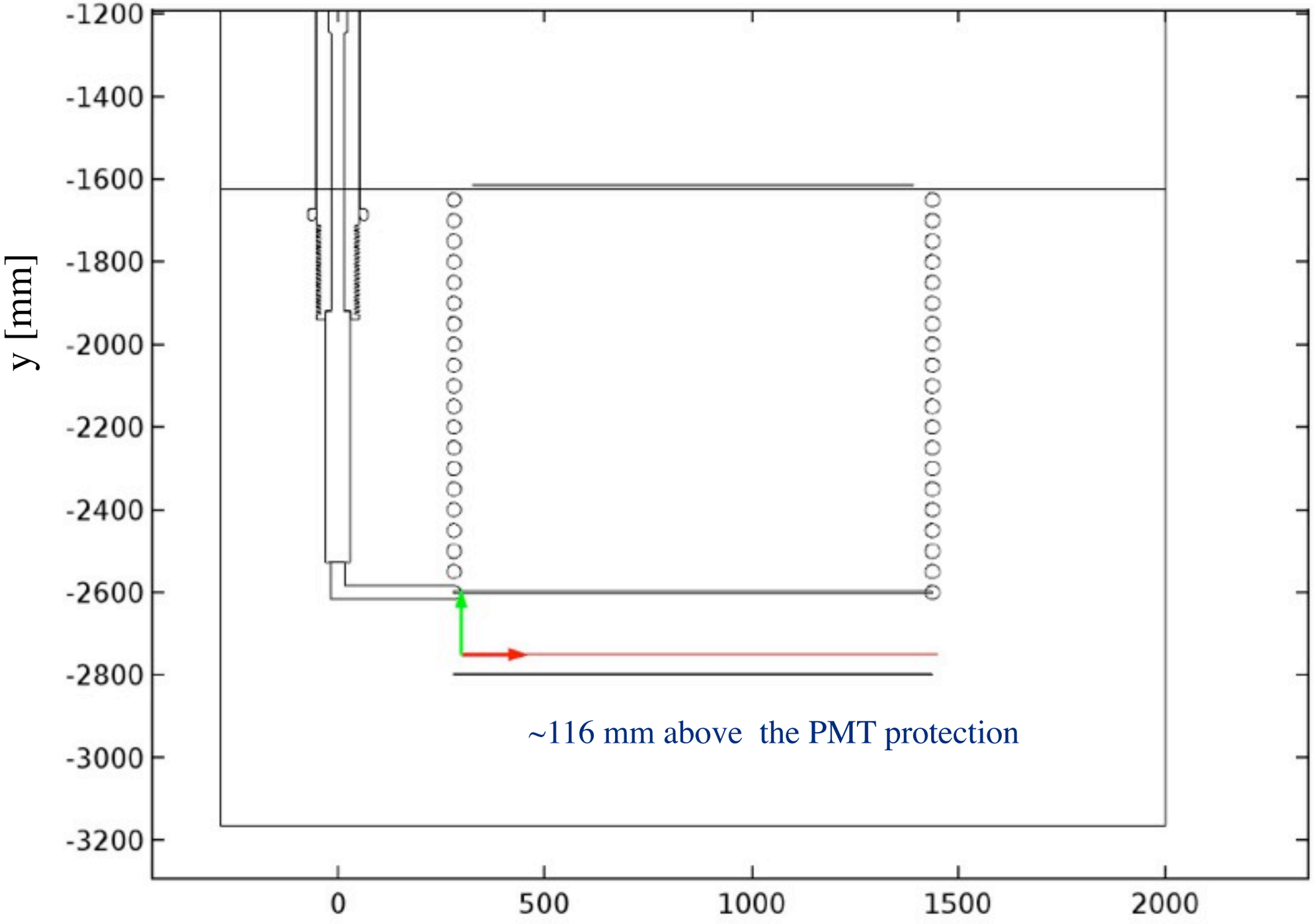
We perform the electric field in different regions of the setup to identify possibly critical regions

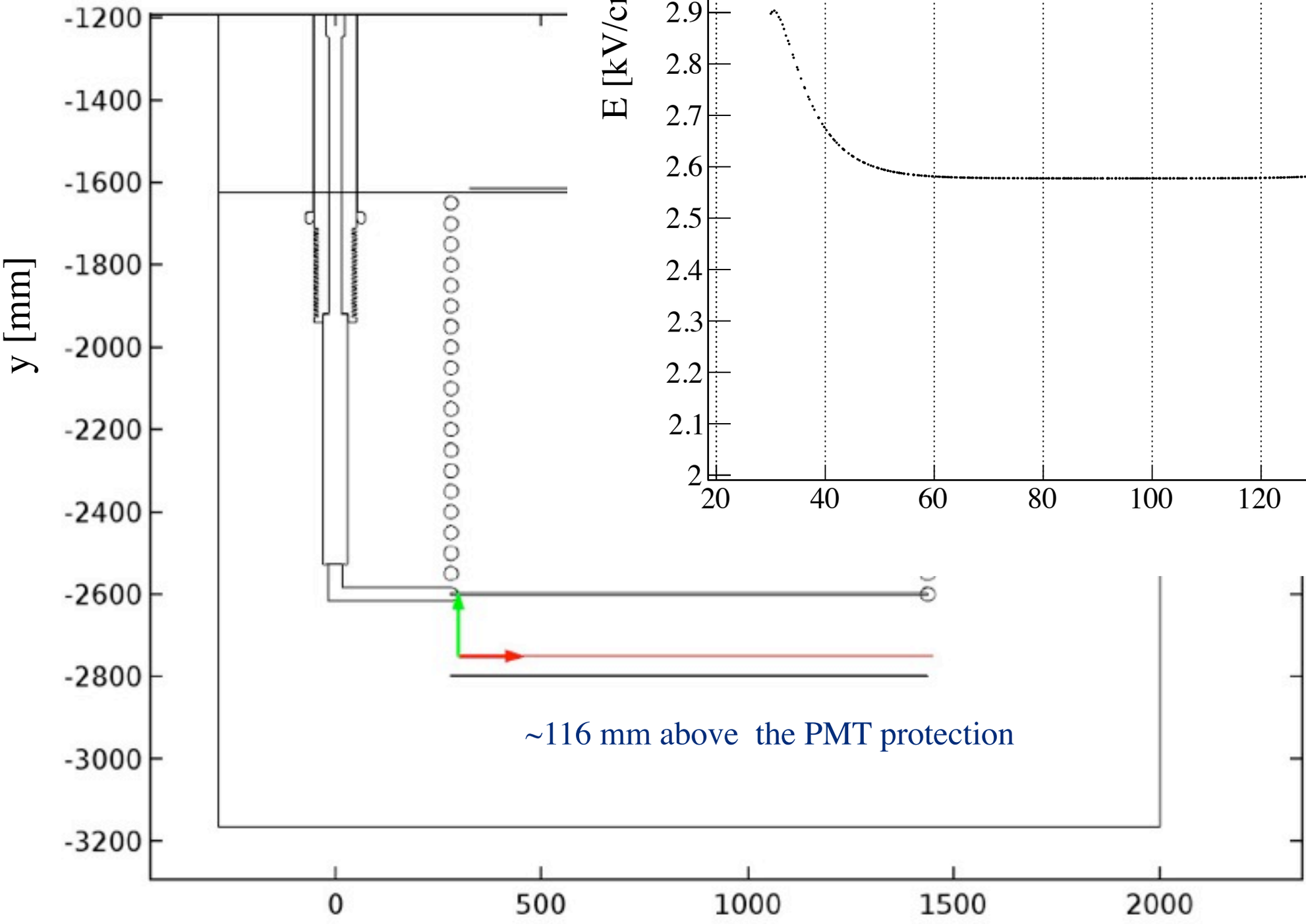


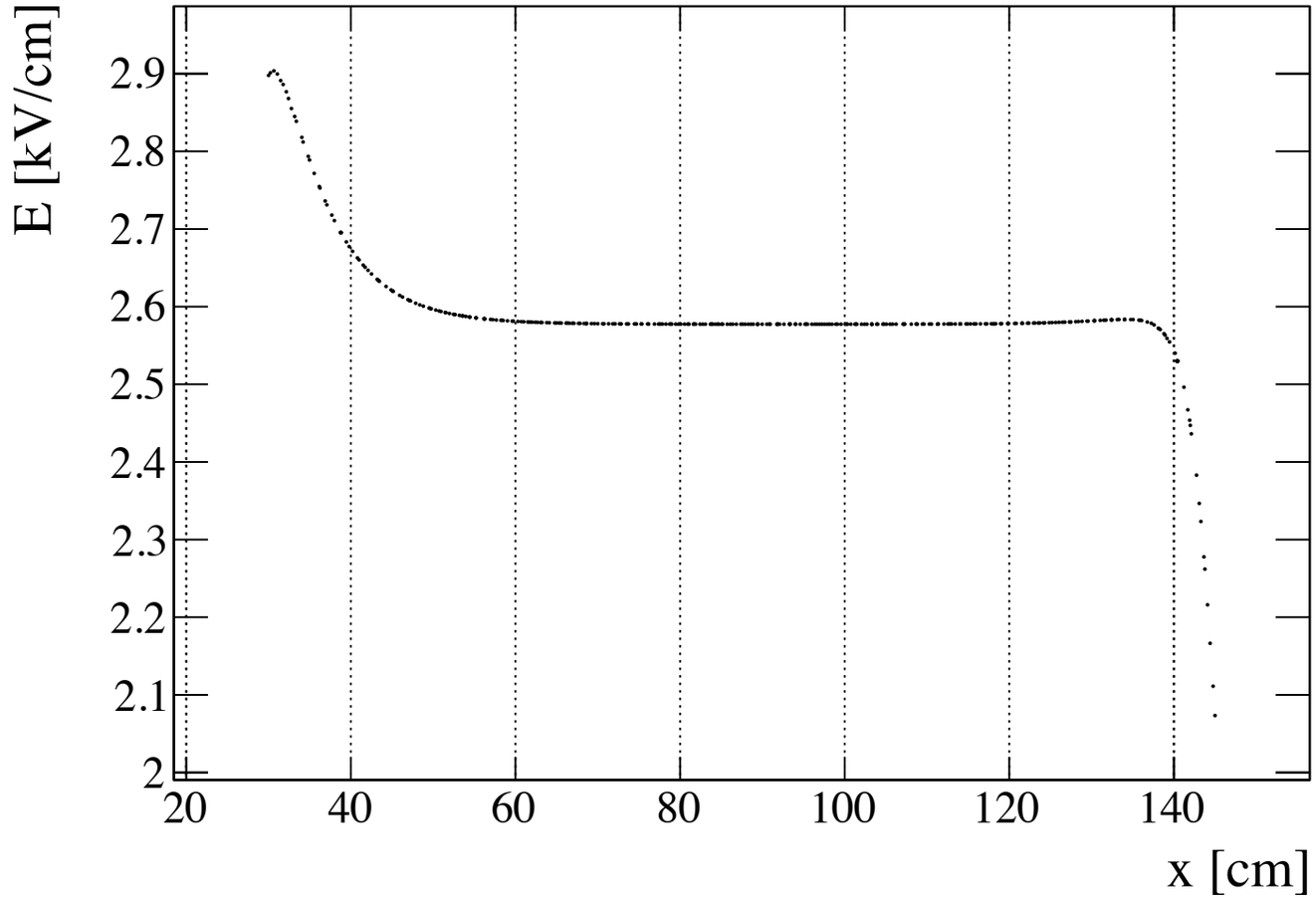
We perform the electric field in different regions of the setup to identify possibly critical regions



~69 mm from the center of the FS


-1200
-1400
-1600
-1800
-2000
-2200
-2400
-2600
-2800
-3000
-3200
y [mm]
0
500
1000
1500
2000
x [mm]
~116 mm above the PMT protection


y [mm]
-1200
-1400
-1600
-1800
-2000
-2200
-2400
-2600
-2800
-3000
-3200
0
500
1000
1500
2000
x [mm]
~116 mm above the PMT protection


E [kV/cm]
2.9
2.8
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2
20
40
60
80
100
120
140
x [cm]

Next steps

➤ Include in the simulation the extraction grid, the LEM,... (work in progress)