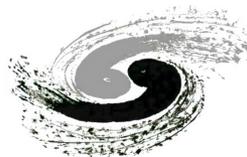
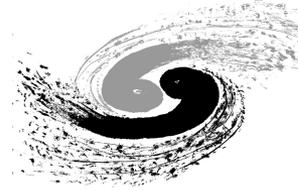


LGAD Sensor Design

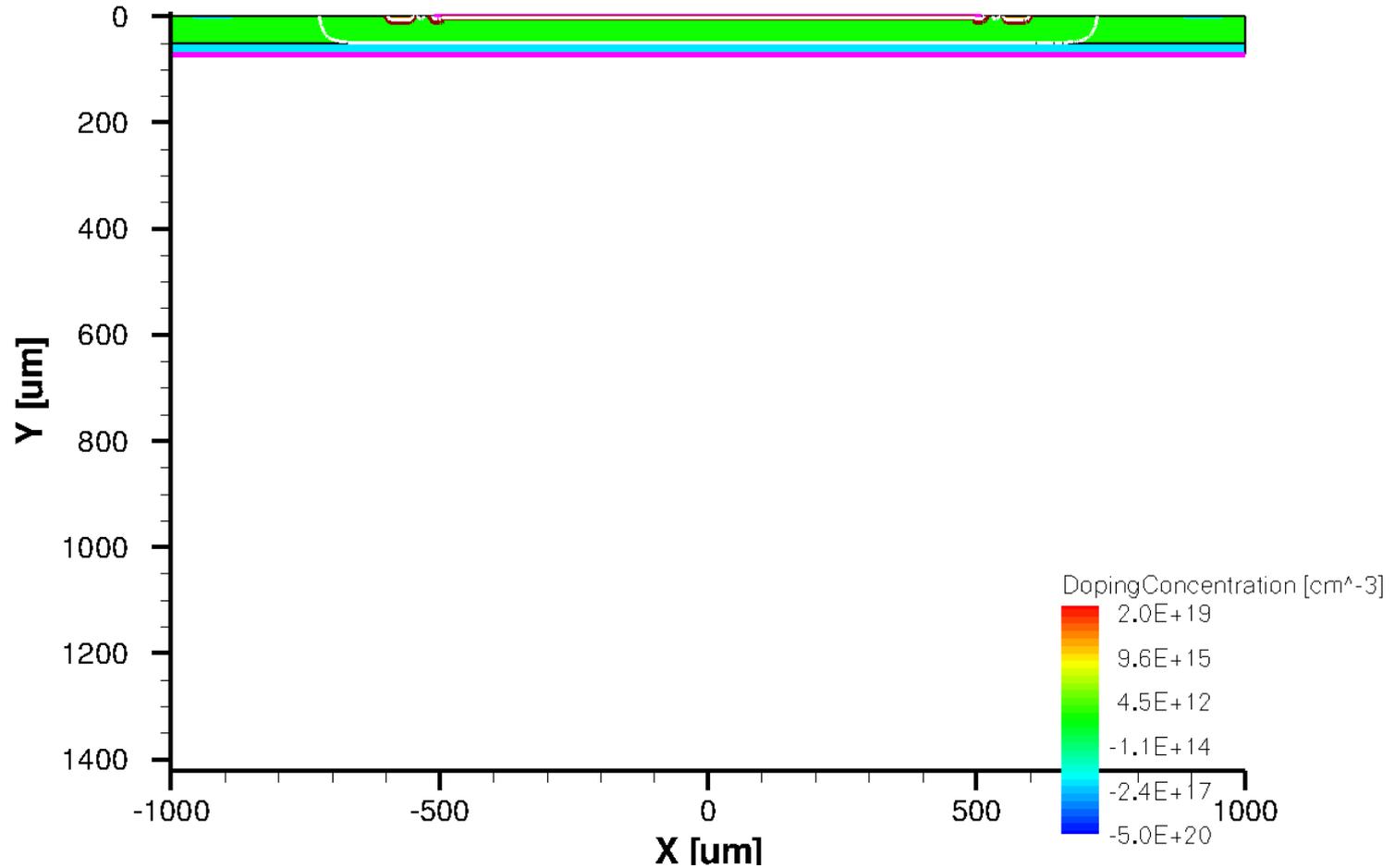


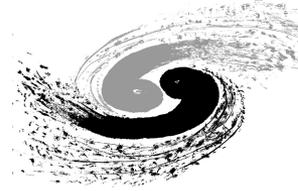
中國科學院高能物理研究所
Institute of High Energy Physics
Chinese Academy of Sciences

WU Kewei
2019/01/10

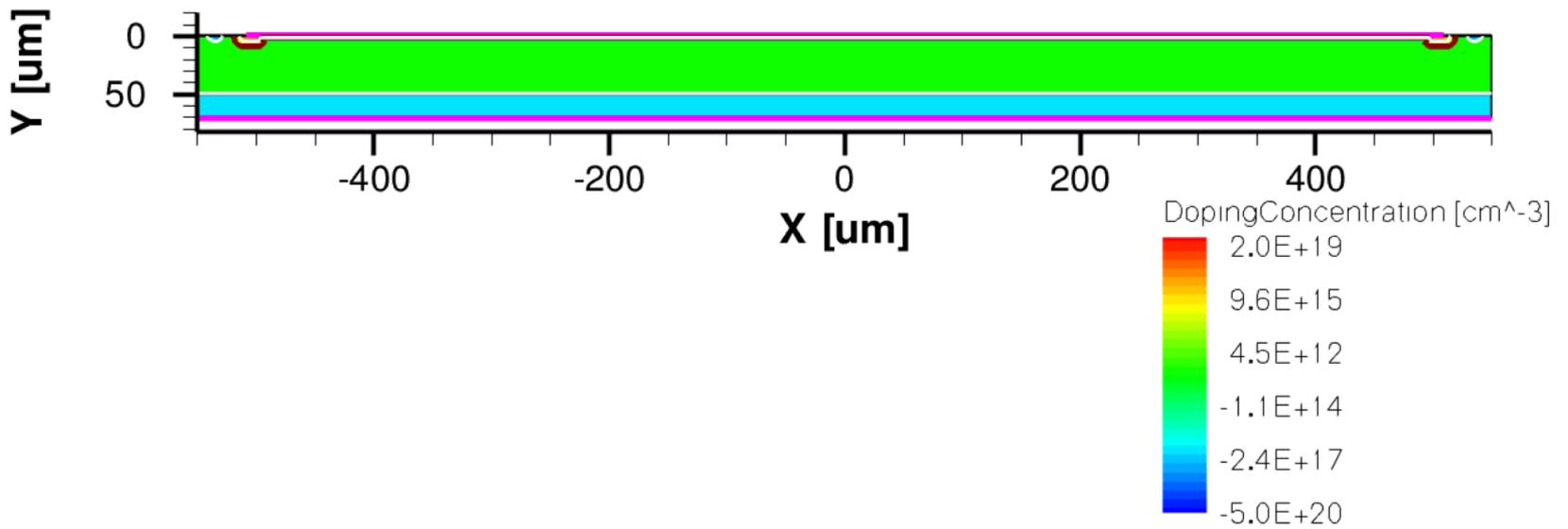


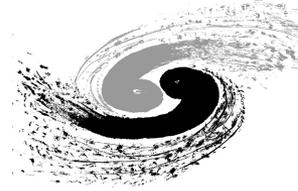
New sensor structure





Old sensor structure

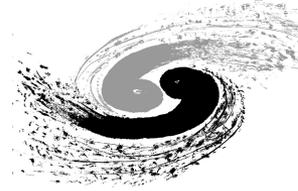




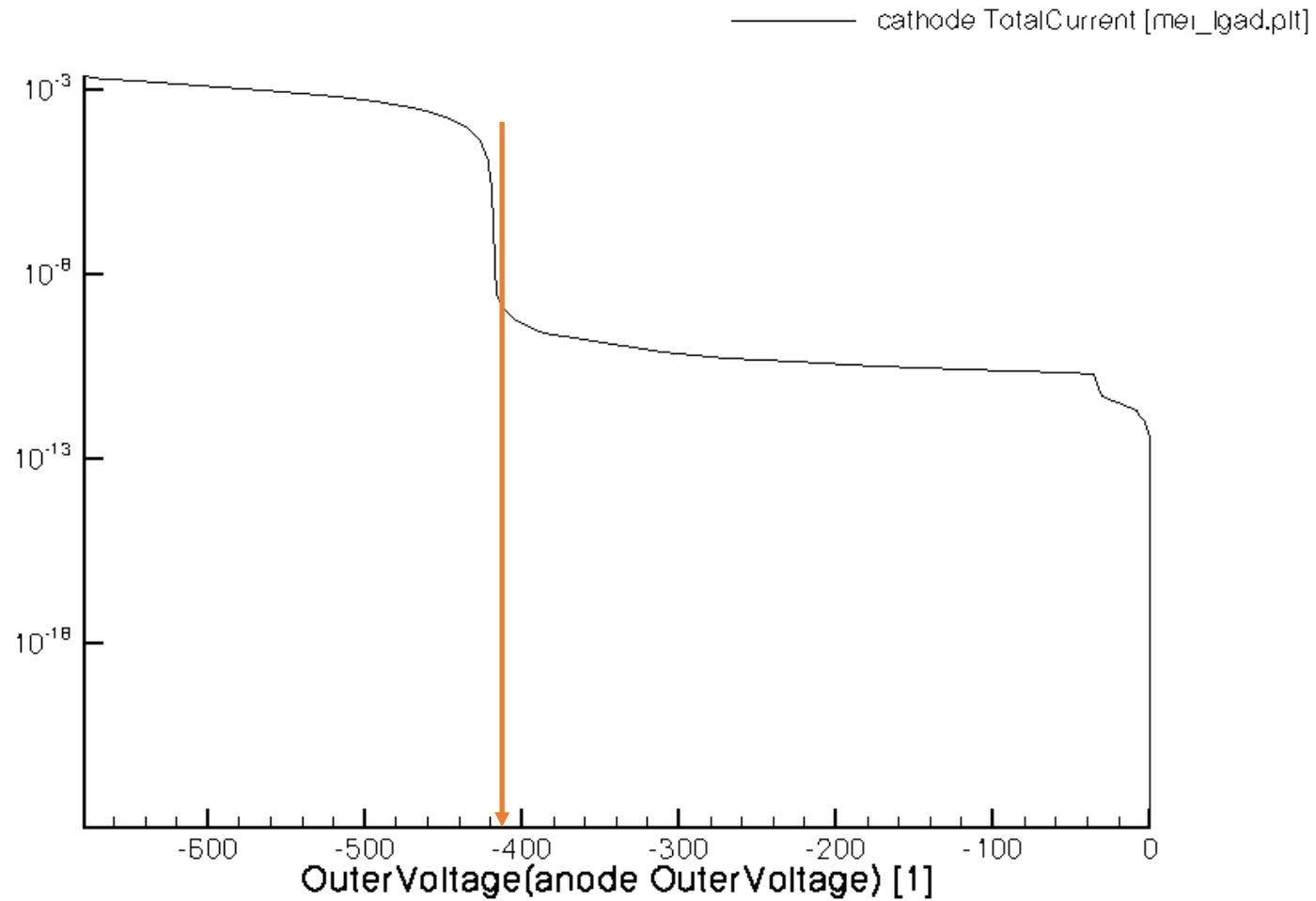
Differences

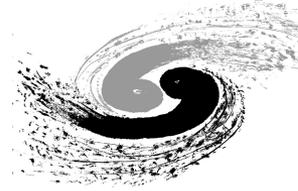
1.Longer (1mm->2mm) 2.Add Wnring and DCstop

```
58 (sdedr:define-analytical-profile-placement "AnalyticalProfilePlacement_pstop2" "AnalyticalProfileDefinition_pstop2" "RefEvalWin_pstop2" "Positive" "NoReplace" "Eval")
59
60 (sdedr:define-refeval-window "RefEvalWin_nring1" "Line" (position -590 0.0 0) (position -558 0.0 0)) ;Wnring doping-----
61 (sdedr:define-gaussian-profile "AnalyticalProfileDefinition_nring1" "PhosphorusActiveConcentration" "PeakPos" 0 "PeakVal" 1e17 "ValueAtDepth" 1e14 "Depth" 7 "Gauss" "Factor" 1.0)
62 (sdedr:define-analytical-profile-placement "AnalyticalProfilePlacement_nring1" "AnalyticalProfileDefinition_nring1" "RefEvalWin_nring1" "Positive" "NoReplace" "Eval")
63
64 (sdedr:define-refeval-window "RefEvalWin_nring2" "Line" (position 558 0.0 0) (position 590 0.0 0))
65 (sdedr:define-gaussian-profile "AnalyticalProfileDefinition_nring2" "PhosphorusActiveConcentration" "PeakPos" 0 "PeakVal" 1e17 "ValueAtDepth" 1e14 "Depth" 7 "Gauss" "Factor" 1.0)
66 (sdedr:define-analytical-profile-placement "AnalyticalProfilePlacement_nring2" "AnalyticalProfileDefinition_nring2" "RefEvalWin_nring2" "Positive" "NoReplace" "Eval")
67
68 (sdedr:define-refeval-window "RefEvalWin_DCstop1" "Line" (position -954 0.0 0) (position -890 0.0 0)) ;DC stop doping-----
69 (sdedr:define-gaussian-profile "AnalyticalProfileDefinition_DCstop1" "BoronActiveConcentration" "PeakPos" 0 "PeakVal" 5e18 "ValueAtDepth" 1e15 "Depth" 4.5 "Gauss" "Factor" 1.0)
70 (sdedr:define-analytical-profile-placement "AnalyticalProfilePlacement_DCstop1" "AnalyticalProfileDefinition_DCstop1" "RefEvalWin_DCstop1" "Positive" "NoReplace" "Eval")
```

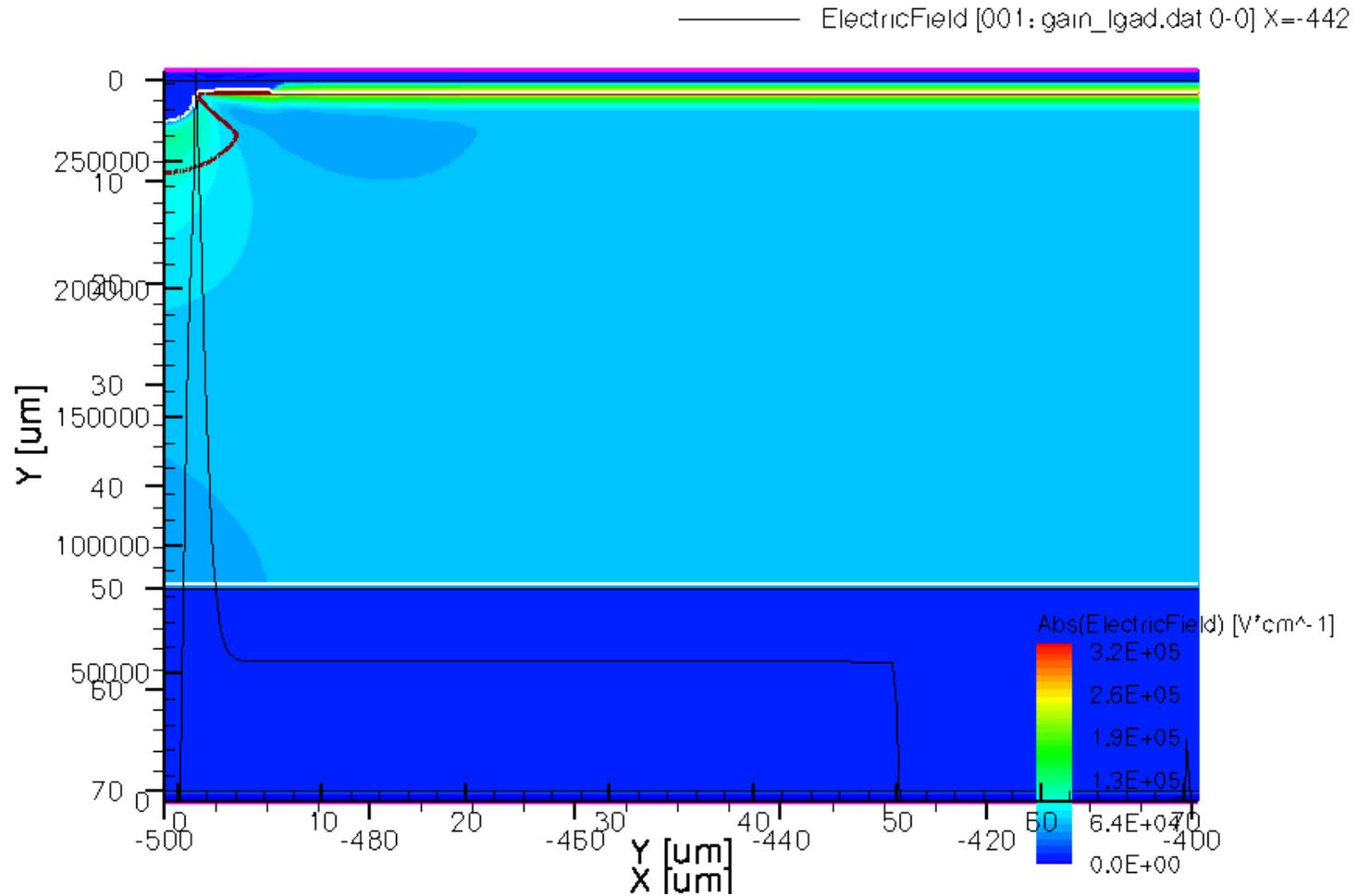


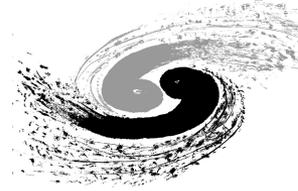
IV simulation



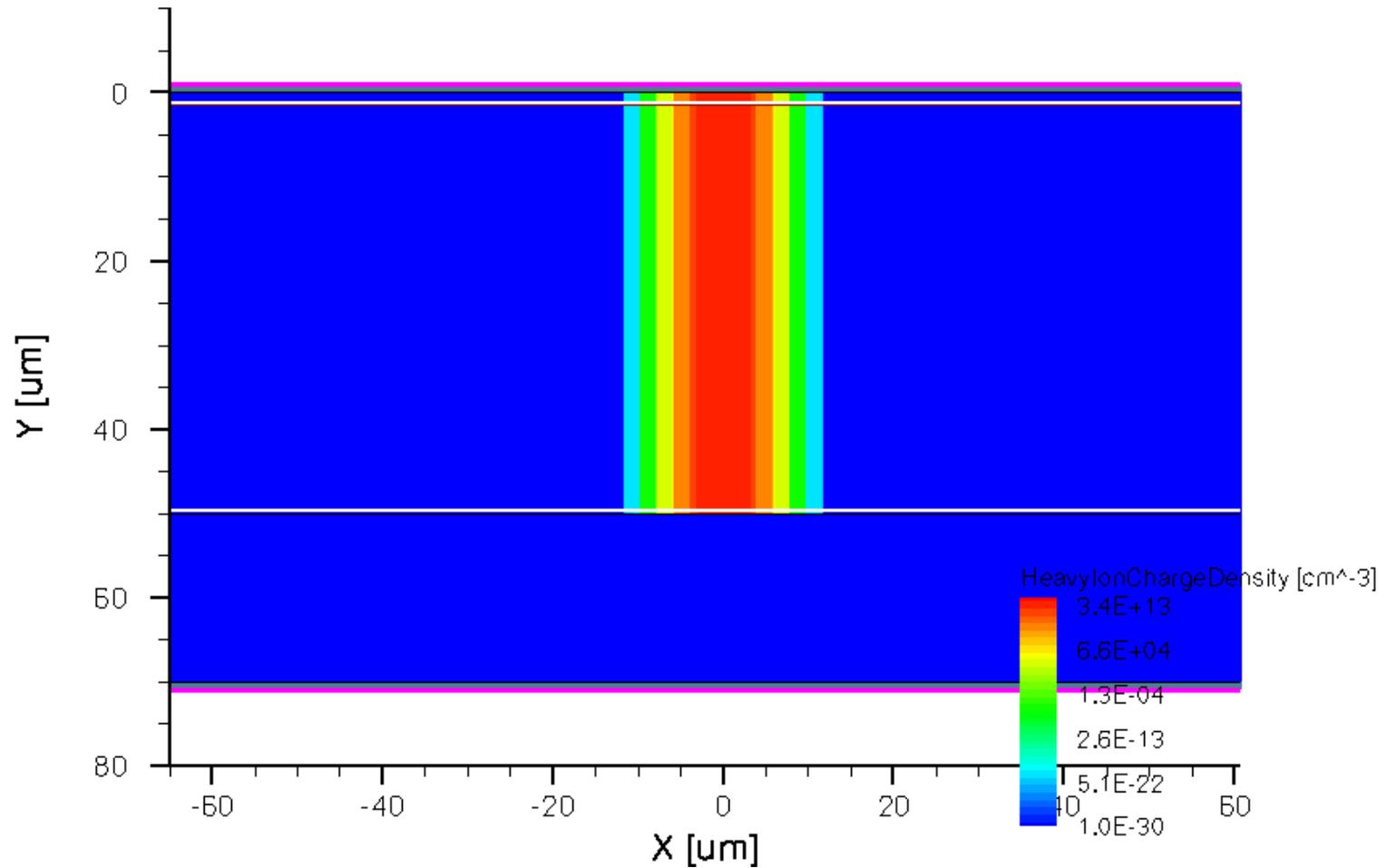


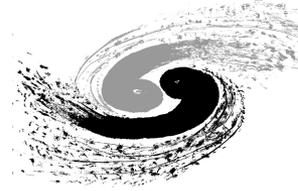
Electric field at 300V





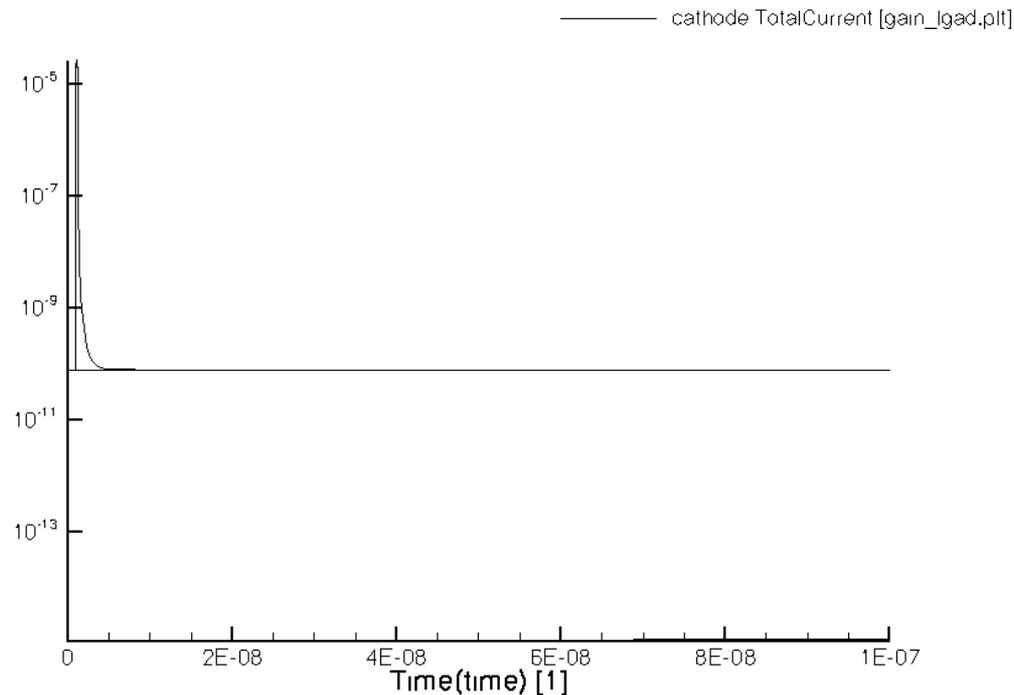
Heavy ion model





Gain simulation at 300V

$$gain = \frac{5.225454 \times 10^{-15}}{6.312 \times 10^{-16}} = 8.27$$



Thanks for your listening!



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