

# Minutes of RESULTS, PITZ Physics Seminar, 2019-01-31

Project: PITZ

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## 1) Agenda

- a) AOB
- b) Cake by Ye's wife for celebration: PPS #700
- c) Talk by I. Isaev: RF simulations for cathode vicinity irregularities of the Gun4.5

## 2) Results:

1. Cake indeed had to be eaten fast: It was nice.
2. Group members should not disturb other group members with issues which aren't urgent (for example a signature for travel request). Use mail and email
3. James and Prach were asked when they would send a thesis draft to Frank
4. German-speaking guides searched for a tour in May (Raffael, Mikhail, Grigorii)
5. MBI Laser cooling upgrade might happen in ~ 10 days (if we're lucky). However,  $\mu$ CTA tests might be done in parallel, then it's not necessary to have a shutdown in this time
6. Igor implemented some grooves, protrusions, machining traces, and different rounding of the cavity backplane to simulate the dark current in CST
7. If the gun has a more smoother curvature (more but smaller staircase-like rounding) has a slightly smaller peak electric field (but more maxima), but more maxima (more discrete steps of the rounding)
8. The peak electric field is not that different with all the flaws, but the electric field has a different shape
9. It's not possible to include all the flaws at once, CST would crash
10. The electric field in the rounding area is much smaller than the electric field on the cathode
11. The simulation results are not conclusive: The small increase of the peak electric field might lead to a higher dark current, but not necessarily
12. Next step: Calculate (from the analytic formula) the emission: Consider the electric field and the area of the structure which shows this high field. Tuck it into the equation and get the 'integrated' dark current from all the flaws which were simulated
13. Idea of Anne: Simulate a rounding, which doesn't close (in an angular way), but has then a small kink (as if you draw a circle and there's a step where you start/end)

Protocol prepared by R. Niemczyk