

# Summary of discussed new High Rep Rate Circuit requirements

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# Overview

- We would like two new HRR circuits...
- HRR Circuit II, for system II, similar in design to the first HRR Circuit I.
- HRR Circuit III, for the fixed gap system, in which we would like to include some new features.
- Thanks to Kyrre we have a new idea which *\*might\** help to ease the design of the circuits by reducing the average current flowing through the switches.

# HRR Circuit II

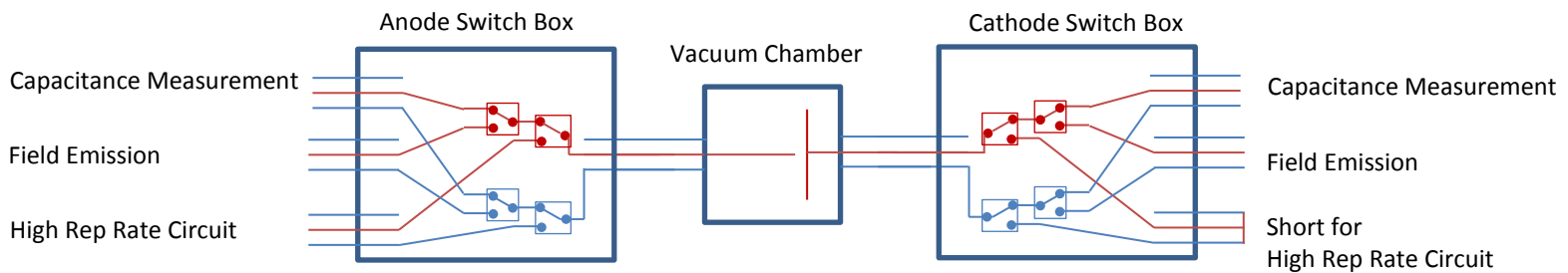
- For System II
- Adjustable voltage supply 0-10kV
- 1kHz repetition rate
- Rise time 0-50ns the lower the better
- No need for co-ax switch box (gap **CAN** be measured via current charging spike, as proposed!)
- No need for push-pull switch arrangement

# HRR Circuit III

- For Fixed Gap System.
- Adjustable voltage supply 0-10kV
- Rep rate as high as possible
- Rise/fall time 0-50ns the lower the better
- Pulse width modulation capability – e.g. push pull switch arrangement. 100/200ns(lower is better) – 10us
- Incorporate 3 way co-ax switch box into design (see rough schematic on next page).

# 3 way co-ax switch box

- A 3 way co-ax switch box will enable us to switch between 3 modes:-
  - High voltage pulse mode
  - Capacitance measurement mode
  - Field emission mode



# New idea

- The current which flows through the switch could be reduced by not discharging the capacitance after the switch to 0V after every pulse.
- Instead it could be discharged just to a value low enough that a BD will not occur (e.g. 50-70% exact value to be investigated).
- Would this help increase the repetition rate achievable for the FGS?

