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Summary from Warsaw meeting and ePIC SVT update

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EIC R&D WP1 SVT meeting

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Summary from Warsaw meeting

- EIC Users Group and ePIC collaboration meeting
  - Agenda: https://indico.cern.ch/event/1238718/timetable/#20230725
  - Here notes from discussions with project and ePIC SVT colleagues:

- An updated **tiling study** is needed for the outer barrel and endcaps (i.e. staves and disks) to reflect the change in RSU size and the limitation in possible EIC LAS sizes due to manufacturing constraints from the foundry
  - Disks are a concern; tiling of the outer barrel is a coupled challenge, although perhaps less difficult
  - See Peter's talk today

Summary from Warsaw meeting

- Discussions continue on a **combined cooling solution for tracking** (Si + MPGD) and LGAD-TOF
  - Concerns with possible issues from water cooling observed in other experiments
  - Concerns about material for CO2 cooling (esp. titanium pipe)
  - Novec came up as another possibility
  - Air cooling of the inner barrel needs understanding on how to guide air in and out having outer barrel and endcaps around it

Summary from Warsaw meeting

- **Background, radiation levels, hit occupancy**
  - Background task force has simulated physics and background events
  - All material and relevant links to repositories with simulation results on their page on the ePIC Wiki https://wiki.bnl.gov/EPIC/index.php?title=Background
  - Radiation maps
    - Available separately for physics (i.e. ep collisions/DIS events) and for each background type, for 6 months of running
    - For SVT work, what is needed is radiation maps of fluence and TID that include physics and background
      - Hadron and electron beam gas depend on running history and get lower with time, no run plan available yet
      - Background also depends on luminosity
    - Possible way of combining various contribution to radiation maps would be a worse case scenario (e.g. max luminosity, assume hadron and electron backgrounds stay as in first year)

Summary from Warsaw meeting

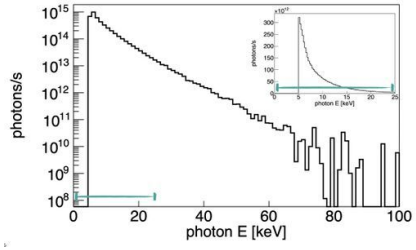
- **Background, radiation levels, hit occupancy (continued)**
  - Hit/second in different detector regions available, separately for ep collisions/DIS events, and different backgrounds
  - For SVT work, what is needed is the hit occupancy, i.e. hits/cm2/sec, in each barrel layer and each disk, including physics and background hits
  - This should be doable using the available simulation results (available as root files)

Summary from Warsaw meeting

- Running **simulations with background**
  - See talk by Kolja https://indico.cern.ch/event/1238718/contributions/5431901/

Background Modeling

Sources:
- **e+gas, h+gas:** "Fixed target" events
- **Synchrotron Radiation:** 1.8M photons from SynRad:
- NB: No "MB events" background for now



- **Input files, rates, etc.:** Zhengqiao Zhang, Jarda Adam, Benjamen Sterwerf, Rey Cruz Torres - Background Wiki
- **Merge** with a given signal (DIS, particle gun):
  1. Select a time slice width, e.g. 2μs for MAPS integration time
  2. Place signal event(s) at random point(s) in the slice
  3. Select **how many** background events to add from Poisson distribution
  4. Draw random events, or SR photons from weighted distribution
  5. Place at **uniformly random times**

ePIC SVT update

- **SVT page on ePIC wiki** being populated, it will contain relevant information and useful links
  - https://wiki.bnl.gov/EPIC/index.php?title=Si_Vertex_Tracker
  - See links to indico, mailing list, sharepoint

- SVT **meetings** will now be in the ePIC/Detector/Tracking/Silicon Vertex Tracker category (link on wiki page)
  - i.e. we are moving away from the EIC SiC indico category as we have now fully transitioned to ePIC SVT DSC
  - **Next meeting: Tuesday 8 August**

- The **project sharepoint** will be used to store technical documents (specs, drawings, procedural documents, etc)
  - Dedicated ePIC/Tracking/Silicon folder (link on wiki page)
  - Substructure will be added to reflect WBS/Work Packages structure (both being worked on by DSL/DSTC/CAM)