

Cooling Discussion - Liquid, Space

- NEW: Invited Elke, Rahul, Dan, Girish today
 - "...option of switching the outer barrel and disks to a water-cooled system"
 - "There are a few concerns regarding the air system that we would like to bring up, the biggest concern being the amount of space needed for the ducts and insulation inside the detector."
 - Roland: 98.5% space allocated now around EEEMCAL, backward end. Packing moderately refined
 - Roland sheet shows cross sections (in^2) 205in, 455 out
 - Joe has 133in, 259 out. Meet with Roland, Girish to resolve worksheet issues
 - V. 19 <https://indico.bnl.gov/event/31239/>
 - 430/500 fraction with new numbers
 - Insulation still a concern
 - Joe send technical package to BNL for cooling system, BNL submit to vendors (after one round of cooling cross section refinement).
- Timeline for major steps to "Validate" cooling design
 - Simulations by FDR (performance viability), space (insulation, near EEEMCAL), cost (Vallery, group internal, but more than \$500k prelim?)
- Liquid VS Air
 - Inner disk air cooling makes sense for material budget, scattering
 - Can layer 3 and 4 be liquid? Simulations of impact?
 - Air design allows us to just barely meet performance goals
 - Cooling power of outer barrel is only 1/3rd of requirements, disks 2/3rd.
 - Limited gain for switching
 - Performance numbers aren't fully consistent, but we only have the simulation results that we have for now
 - Girish: water temp rise 2C for other groups, SVT had requested 3C if possible
 - Can we go to smaller tube diameter.
 - Just lower flow rate? → more heat into environment?
- Can't justify cost increase for exotic solutions or unnecessary rework