Recent MAP Reviews

Front End Recommendations

Front End Studies Meeting

September 25, 2012
MuPac Recommendations

General but also apply to the Front End:

- Perform a global optimization of the cooling channel parameters to maximize the MC/NF performance.
- Find additional opportunities for benchmarking the cooling simulation codes.
- Include all possible heating effects in the cooling simulation codes and explore possibilities to benchmark against experimental long-term emittance evolutions.
- Show beam gymnastics through the entire accelerating system, including at least beam loading effects, by a front to end simulation.
- Study if the 300-mm aperture in 201-MHz cavities is necessary.
- Develop clear definition of the “safe” accelerating gradient.
MuPac Recommendations II

Front End Specific:

- Study the robustness of the front end RF system, with its large number of cavity frequencies and voltages, and determine an approach for further optimization of the system.
Magnets Recommendations

These are general recommendations that also applies to the Front End magnets

• Determine if the magnetic coupling between neighboring magnets in the cooling systems has the potential to cause a chain reaction whereby all magnets are affected if just one of them quenches. Design a mitigation strategy, if necessary.

• Produce a list of all magnetic elements that give number, radius, field, length and the radiation deposition.
Beam Dynamics and Simulations

Some general comments that apply also to the Front End

- Continue to work with the SLAC code group for the RF design and breakdown studies, and for field emission simulations.
- Develop, over time, a more end-to-end simulation capability that can couple sub-systems together to the extent required.
- Carry out benchmarking and verification studies as needed where key physics problems are concerned.
RF Systems

- Develop a table defining performance parameters to clearly state operational limits for different cavities in high magnetic field. Define safe accelerating gradient. (November 2012)

- Explore ways to expedite the delivery of the new magnet to be able to test the 201 MHz cavity in high magnetic fields in FY13.