Opening Remarks

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VCC Workshop, LBNL

May 13, 2014

Key dates for the IBS process

	Lattice sign-off	Technology sign-off	IBS review
6D Cooling	**-**	**10/1/14**	**3/27/14**
Charge sep./ bunch merge	**2/2/15**	**7/30/15**	**3/28/16**
Final cooling	**5/1/15**	**10/29/15**	**3/28/16**

- Lattice files + performance evaluation = one month before sign-off;
- Technology specification = one month before sign-off;
- IBS review ready = one month before review.

IBS focus

At the end of CY 2014 the initial baseline selection process will address:

- The likely performances
- The reliability of the simulations
- The plausibility, and state of readiness of the components and their engineering
- The likely relative costs

Basic considerations I

- If acceptable answers are not available, it probably means that the cooling technology and channel cannot be selected as the initial baseline.
- Describe cooling technology, basic layout of the cooling channel
- Discuss:
  - Experimental results implying that the RF gradients and magnetic fields assumed are likely to be feasible.
  - Any extrapolations made from experimental results to values used in the simulations.

Basic considerations II

- Realistic end-to-end simulation (end of phase rotator to beginning of final cooling):
  - Include space along the channel for assembly, maintenance, replacement of components, beam monitoring, steering, etc.
  - Include reasonable models of fringe fields from magnets; hard-edge fields are not acceptable.
  - Use either ICOOL or G4beamline.
  - Include realistic windows wherever needed.

Basic considerations III (technology)

- How the fields are specified:
  - Where magnetic field maps are used, describe mesh sizes and accuracy.
  - Where magnetic fields are computed, describe the formula(s) and the accuracy; are they Maxwellian?
  - How realistically are the RF cavities modeled (e.g. pillbox or more realistic geometry and fields)?
- The windows used for RF cavities and absorbers.
- The pressure windows (where applicable).
- The space charge estimates or calculations.
- The beam loading estimates or calculations.
- Any untested assumptions.

Very important criteria

- $N(\mu^+)=N(\mu^-)=4.7x10^{12}$
- Transverse emittance, normalized: 0.3 mm
- Longitudinal emittance, normalized: 1.5 mm
- Transmission: 64% for μ^+ and 58% for μ^-
- Matched to a 3 T constant solenoid field

Important criteria

- Too numerous too mention
- Magnets: # of coils, max field on conductors, current densities, allowances/margins, forces/support, stored energy, quench protection
- RF: # of cavities, # of frequencies, gradients, magnetic field on RF, RF power requirements, cooling requirements, space allowances
- Absorbers: material, temperature, windows/stresses, design feasibility, cooling issues
- All: what experimental demonstrations are required?
- Integration issues

Conclusions

- 6D cooling issues are pressing, there is a bit more time for charge separation, bunch merge, final cooling.
- Have baseline lattice, concentrate on technology issues, joint effort with RF and magnet people.
- Discussion in preparation for the upcoming MAP collaboration meeting (tentative schedule: next slide).

Tentative agenda, cooling parallel sessions at MAP CM

PS #1: Wed, May 28, 10:30-12:30 (Cooling, 6D)

- VCC (Diktys Stratakis, 25)
- HCC (Katsuya Yonehara, 25)
- High field cooling channel for micron scale emittances (Hisham Sayed, 20)
- Discussion (0:50)

PS #2: Wed, May 28, 13:30-15:30 (Joint with Magnets + RF)

- Vacuum RF issues (Daniel Bowring, 20)
- Conceptual Picture of the HCC Magnet System (Steve Kahn, 20)
- ??? (Soren Prestemon, 20)
- RF issues relevant to both HCC and VCC (Alvin Tollestrup, 30)
- Discussion (0:30)

Tentative agenda, cooling parallel sessions at MAP CM

Mgmt session: Wed, May 28, 17:30-18:30

- IBS, issues, planning

PS #3: Thu, May 29, 08:00-10:15 (Initial + charge sep + bunch merge)

- Initial (Yuri Alexahin, 30)
- Charge separation (Cary Yoshikawa, 20)
- Bunch merge (Yu Bao + Bob Palmer, 20)
- Helical bunch merge (Amy Sy, 20)
- Discussion (0:45)

Thank you!