

# Muon Accelerator Program Design & Simulations (WBS 2) Monthly Status Review

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# Outline



- L2 Manager Updates
- Beam Emittance and Energy Spectra for Hg and C Targets (J. Scott Berg)
- Thoughts on moving forward with Target and Front End studies (Kirk McDonald, Diktys Stratakis)

# L2 MANAGER STATUS REPORTS: DESIGN & SIMULATION (WBS 2)

# Monthly L2 Status Report -

WBS: 02.01 – Proton Driver

27 February 2015  
Presenter: Keith Gollwitzer



<p><b><u>Milestone Status (Progress)</u></b></p> <ul style="list-style-type: none"><li>• Specifications and ring lattices provided to L1 awhile ago</li></ul>	<p><b><u>Resource Conflicts, Plan Changes and Issues</u></b></p> <ul style="list-style-type: none"><li>• Some Fermilab personnel working on different tasks.</li></ul> <p><b><u>Late Items</u></b></p> <ul style="list-style-type: none"><li>• Concept for Delivery Beam Line including Final Focus element(s).</li></ul>
<p><b><u>Summary of Previous Month</u></b></p>	<p><b><u>Quarterly Plans</u></b></p> <ul style="list-style-type: none"><li>• Work on article</li></ul>
<p><b><u>Upcoming Work (Next Month)</u></b></p> <ul style="list-style-type: none"><li>• Start work on article</li></ul>	

# Monthly L2 Status Report -

WBS: 02.02

27 February 2015  
Presenter: Diktys Stratakis



<p><b><u>Milestone Status (Progress)</u></b></p>	<p><b><u>Resource Conflicts, Plan Changes and Issues</u></b></p>
<p><b><u>Summary of Previous Month</u></b></p> <ul style="list-style-type: none"><li>• Produced distributions for C and Hg Targets (Ding, Berg)</li></ul>	<p><b><u>Late Items</u></b></p>
<p><b><u>Upcoming Work (Next Month)</u></b></p> <ul style="list-style-type: none"><li>• Continue evaluation for Hg (target group)</li><li>• Buncher &amp; Rotator optimization for C target</li><li>• Studies with vacuum and pressure</li></ul>	<p><b><u>Quarterly Plans</u></b></p> <p>The FE team will focus on March/ April to produce results for the posters and papers submitted for the 2015 IPAC</p>

# Monthly L2 Status Report -

WBS: 02.03 – Cooling

27 February 2015

Presenter: Pavel Snopok



<p><b><u>Milestone Status (Progress)</u></b></p>	<p><b><u>Resource Conflicts, Plan Changes and Issues</u></b></p> <ul style="list-style-type: none"><li>• Will there be a special template for JINST?</li></ul>
<p><b><u>Summary of Previous Month</u></b></p> <ul style="list-style-type: none"><li>• Based on Katsuya Yonehara's suggestion Diktys Stratakis performed simulations of the hybrid cooling channel at different pressures (34/64/94/124 atm). There is a slight dependence of the final emittance on gas pressure, more evident above 100 atm, cooling below 0.4 mm still possible.</li><li>• Diktys has also reported on the results of the multivariate optimization of the luminosity in the VCC.</li><li>• Discussed JINST and IPAC articles and IPAC headcount.</li></ul>	<p><b><u>Late Items</u></b></p>
<p><b><u>Upcoming Work (Next Month)</u></b></p> <ul style="list-style-type: none"><li>• Ben Freemire is to present an update on plasma loading in the hybrid channel.</li><li>• Tianhuan Luo is to present an update on Be windows in the hybrid channel. – both results will be presented at IPAC'15.</li></ul>	<p><b><u>Quarterly Plans</u></b></p>

# Monthly L2 Status Report -

WBS: 02 05 Collider Ring Design

27 February 2015  
Presenter: Y. Alexahin



<p><b><u>Milestone Status (Progress)</u></b></p> <ul style="list-style-type: none"><li>• Documenting 3TeV muon collider lattice design – continued.</li></ul>	<p><b><u>Resource Conflicts, Plan Changes and Issues</u></b></p> <ul style="list-style-type: none"><li>• Work on the lattice design stopped.</li></ul>
<p><b><u>Summary of Previous Month</u></b></p> <ul style="list-style-type: none"><li>• No activity due to occupation with tasks unrelated to MAP</li></ul>	<p><b><u>Late Items</u></b></p>
<p><b><u>Upcoming Work (Next Month)</u></b></p> <ul style="list-style-type: none"><li>• Continuation of writing the report on the 3TeV muon collider lattice.</li></ul>	<p><b><u>Quarterly Plans</u></b></p> <ul style="list-style-type: none"><li>• Finish report on the 3TeV muon collider lattice.</li></ul>

# Monthly L2 Status Report -

WBS: 02.06 - Machine-Detector Interface

27 Feb 2015  
Presenter: Nikolai Mokhov



<p><b><u>Milestone Status (Progress)</u></b></p> <ul style="list-style-type: none"><li>• Design of high-performance systems to suppress radiation load on the Higgs Factory (HF) SC magnets and detector.</li><li>• Background studies with developing background rejection techniques.</li></ul>	<p><b><u>Resource Conflicts, Plan Changes and Issues</u></b></p> <p>None.</p>
<p><b><u>Summary of Previous Month</u></b></p> <ul style="list-style-type: none"><li>• MARS Higgs Factory MDI model is being modified to neutralize the detector solenoid magnetic field in the Q1 and tungsten nozzle apertures.</li><li>• To use the full-statistics MARS source for 1.5-TeV MC, the analysis was modified to replace double layer angle criteria by cuts in local X and Z coordinates of each module in sublayers. Data for the geometry setup No. 1 were analyzed. Results are consistent with previous low-statistics analysis.</li></ul>	<p><b><u>Late Items</u></b></p> <p>None.</p>
<p><b><u>Upcoming Work (Next Month)</u></b></p> <ul style="list-style-type: none"><li>• Complete development of the Higgs Factory detector solenoid field suppression techniques in the beam region, test it and prepare for the MARS production runs.</li><li>• If resources are available, perform the background rejection analysis for the detector geometry setups No. 2 to 4.</li></ul>	<p><b><u>Quarterly Plans</u></b></p> <p>Wrapping up the simulations for HF and 1.5-TeV MC and writing documentation.</p>



# Monthly L2 Status Report -

WBS: 02 07 Decay Rings

27 February 2015  
Presenter: Alex Bogacz



<p><b><u>Milestone Status (Progress)</u></b></p> <ul style="list-style-type: none"><li>• <b>‘Design of a muon storage ring, including injection system, that would result in a precision, high intensity neutrino source with well understood systematics (e.g. nuSTORM and NuMAX)’</b><ul style="list-style-type: none"><li>– Final design as reported at MAP Collaboration Winter Mtg. in Dec. 2014, no further technical work since ...</li></ul></li></ul>	<p><b><u>Resource Conflicts, Plan Changes and Issues</u></b></p>
<p><b><u>Summary of Previous Month</u></b></p> <ul style="list-style-type: none"><li>• <b>Assigned work on JINST articles:</b><ul style="list-style-type: none"><li>– ‘Decay Ring Design for Long Baseline NF a la NuMAX” - J. Pasternak and D. Kelliher</li><li>– ‘Decay Ring Options for Short Baseline NF a la NuSTORM’<ul style="list-style-type: none"><li>○ Design and Beam Dynamics of the RFFAG - J-B. Lagrange</li><li>○ Design and Beam Dynamics of the FODO Ring - A. Liu</li></ul></li></ul></li></ul>	<p><b><u>Late Items</u></b></p> <p><b><u>Quarterly Plans</u></b></p> <ul style="list-style-type: none"><li>• <b>Finalize JINST articles</b><ul style="list-style-type: none"><li>– End of September, 2015 - submission target date</li><li>– Initial peer review</li><li>– Final editing</li></ul></li><li>• <b>Submission of JINST articles to the Editorial Board</b></li></ul>
<p><b><u>Upcoming Work (Next Month)</u></b></p> <ul style="list-style-type: none"><li>• <b>Continue work on JINST articles</b></li></ul>	

# AOB



- Issues?
- Questions?
- Comments?