

DUNE

Atmospheric neutrinos & Nucleon decay

WG meeting

Monday, Oct 12th, 2015

Alessandra Tonazzo

Hugh Gallagher

New conveners for PDK

- Jen Raaf (Fermilab)
- Michel Sorel (Valencia)

They will chair the PDK part of the meeting starting on Monday, October 26th

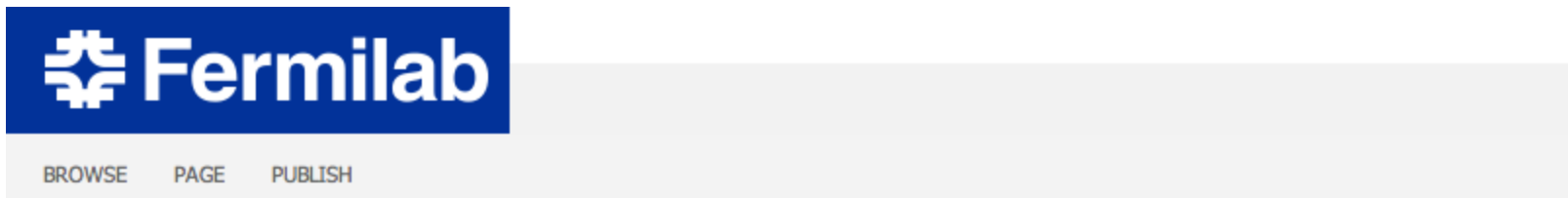
No specific items on PDK foreseen today (unless someone has something to propose)

- message by Ed Kearnes to call for a speaker on the topic of systematic uncertainty for proton decay to be presented at NuINT 2015, November 16-21 in Osaka

Atmospherics

- Some information is now available on the WG webpage

<https://web.fnal.gov/collaboration/DUNE/SitePages/Atmospheric%20Neutrinos%20Working%20Group.aspx>



[DUNE at Work](#) [DUNEScience.org](#) [LBNF](#) [LBNF at Work](#)

Atmospheric Neutrinos Working Group

Purpose:

Evaluate and optimize the physics potential of atmospheric neutrinos in the DUNE FD. Our main goals will be the measurement of mass hierarchy and of the θ_{23} octant. Further topics are Earth tomography with neutrino oscillations, decoherence, non-standard interactions, sterile neutrinos, and other beyond-standard-model physics scenarios. We will also discuss the use of atmospheric neutrinos for detector monitoring and pre-beam commissioning, and evaluate their contribution to the overall physics capabilities in an era when beam data is also available.

Atmospherics: High/Med priority tasks

- Distribution/documentation of LBNE atmospheric neutrino analysis package for use in near-term studies.
- In conjunction with FD reco/sim WG, testing and improving the GENIE/Atmospherics mode in LArSoft (incl. improvements to GENIE flux drivers, inclusion of 3d fluxes)
- Extension of analysis tools to incorporate detector-specific systematics such as differences in up/down acceptance.
- Updating / re-evaluation of detector performance characteristics as full simulation results become available
- Interfacing with reconstruction group on appropriate metrics to evaluate performance on atmospheric neutrino events
- In conjunction with the cosmogenics group, evaluate cosmogenic background mitigation strategies, impact of a veto shield

Atmospherics: Med/Low priority tasks

- Re-evaluate nu/nubar separation capabilities and impact on MH determination.
- Sensitivity studies: sterile neutrinos
- Sensitivity studies: NSI
- Sensitivity studies: other BSM scenarios (decoherence, Lorentz-violation...)
- Sensitivity studies: tau appearance
- Earth tomography studies

Atmospherics : call for contributors

- Please let us (hugh.gallagher@tufts.edu, tonazzo@in2p3.fr) know which task you would like to contribute to
- Atmospheric neutrinos ARE interesting ! ☺

