Concluding comments from "Perfectly outsider"

Yoshitaka Itow ISEE/KMI Nagoya Univ. Pre-DIS EIC workshop 15 April 2018, Kobe

Disclaimer

- I am not a right person to conclude...
- I am just a cosmic ray physicist...
- I am working for VHE CR interactions, but dominated by low-Q² (pT <1 GeV/c)...
- Many of you know nuclear physics well already

Afternoon:

Abhay Deshpande (this WorkShop)

- Invited experts in fields outside the core QCD studies to explore the synergies between EIC science and their own primary research interests:
 - High energy physics, Very high energy cosmic rays, and neutrino science...

I learned a lot



Connection to CR (hadronic universe)



Cosmic rays and interactions

- Cosmic Ray (CR) needs "precise" knowledge of (very) high energy hadronic interactions
 - Reconstruction of extensive air showers
 - Propagation and 2ndary productions
- Essentially low-pT (<1GeV) interactions
 - CR interaction models (EPOS, QGSJET, etc.) tested and improved by LHC p-p and p-Pb data
- Essentially p-A data is needed for air shower
 - p-N or He-N, Fe-N ..
 - Future LHC p-O ?



20th International Symposium on Very High Energy Cosmic Ray Interactions (ISVHECRI 2018)



Nagova University, Nagova, Japan

21-25 May 2018

Asia/Tokyo timezone

20th International Symposium on Very High Energy Cosmic Ray Interactions

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May21-25, Nagoya Overview Symposium topics: Comittees EAS results relevant to Particle Physics Venue Accelerator results relevant to Cosmic Ray Physics Emulsion chamber & Hybrid experiment results Timetable LHC pp and Heavy Ion Physics Bulletins Exotic phenomena, manifestation of a "New Physics" beyond the Standard Model 1st circular · Hadronic cross sections, multiparticle production & hadronic interaction models Space experiment data related to high energy interactions Registration Matter-Antimatter asymmetry Participant List New EAS experimental installations Payment High energy neutrino and muon fluxes High and super high energy cosmic rays, origin & observation Proceedings **ISVHECRI** series: Travel infomartion ISE ICRR.))) 20th International Symposium on Hotel List ISVHECRI 2016 in Moscow Very High Energy Cosmic Ray Interactions ISVHECRI 2014 in Geneve Contact ISVHECRI 2012 in Berlin ISVHECRI2018 isvhecri2018@isee.nago. Important dates: 21-25 May, 2018 10 January 2018 --- Registration open Nagoya University, Nagoya, JAPAN 16 February 28 February 2018 --- Deadline of abstract submission

21 March 2018 31 March 2018

— Deadline of early registration

7 May 2018 --- Deadline of Online registration

From p-A to e-A (nuclear modification)

- CR community considering p-Oxygen at LHC
- What's new in EIC and complement to LHC p-A ?



More direct connection; VHE $\nu\text{-}A$



Conclusion

- EIC can (should) address unique important connection not only to nuclear physics, but also to other fields (QGP, SPIN, HE, CR, etc..)
- For CR, precise knowledge on structure of quark–gluon matter at high energy and at very low-x.
 - "Precise" knowledge on nuclear modification
 - Directly , high energy neutrino physics
- Keep exploring...