

July 20, 2017

Dear members of the DUNE Collaboration,

We, members of KISTI (Korea Institute of Science and Technology Information), Daejeon, Korea, would like to join your collaboration. Please find our application below.

**1) List of persons wishing to join including position**

- Prof. Kihyeon Cho (PI) ⇒ Planned IB representative
- Dr. Insung Yeo (Post-doc.)

**2) Summary of the science and technical experience of the group**

At our institute we have been actively involved in B physics and dark matter searches participating in the CDF and Belle/Belle-II experiments. KISTI, now, would like to join the DUNE collaboration as physics members for following reasons:

- KISTI is leading dark matter research community in Korea supported by government ('15~present).
- KISTI has been officially supporting computing farms by GSDC (Global Science Data Center) for the high energy physics communities in Korea (ALICE Tier-1, CMS Tier-3, Belle Grid farm and LIGO farm).
- KISTI has also National Supercomputing Center (including Tachyon2 supercomputer and 10 Gbps GLORIAD network between KISTI-Fermilab).
- As a member of the Geant4 Collaboration, we have experiences in beam simulation and profiling system with low energy physics.
- We have built and used CDF remote control room and Pacific CDF Analysis farm.
- As a group leader, we have constructed and maintained Belle II Data handling system using metadata.
- K. Cho worked on CLEO experiment for Ph.D ('96), worked as a postdoc at FOCUS ('96-'01), and is working on B physics at CDF, and B physics and dark matter at Belle/Belle II. I.S. Yeo worked on RENO (Reactor experiment for Neutrino Oscillation) for Ph.D ('17).

### **3) Summary of the proposed science and technical contributions to DUNE of the group**

Our possible contributions to computing and data analysis profit from our experiences.

- We may work on generation of DUNE physics for MC production with experience of Geant4 simulation based on KISTI supercomputer.
- For long term, we may work on deep learning on pattern recognition.
- We may also use our experiences on Belle II data handling.

### **4) Resources the group could contribute to DUNE (near term and potential for longer term)**

Our possible contributions to computing resources and manpower.

- For short term, HEP group at KISTI has 200,000 CPU\*hour/year at Tachyon2 supercomputers.
- For long term, KISTI can host DUNE data center in Korea and possibly remote control room.
- For manpower, we have one post-doc. However, we hope to recruit a couple of students (MS or Ph.D level).
- We will apply for a funding from National Council of Science and Technology in Korea for deep-learning based data processing in dark matter research, which may help to the activity in DUNE.

### **5) Names of references (preferably the members of the DUNE Collaboration) or recommendation letters**

- You may get more information from the following DUNE Collaboration:  
Prof. Chang Kee Jung, Kim Siyeon, Jaehoon Yu and Tom Junk.

HEP Group at KISTI has lots of experience on CDF, Belle, Geant4 and LQCD for more than 10 years and also leads dark matter community in Korea, which will help to DUNE.

Thank you for considering our proposals.

Sincerely,



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