Contribution ID: **72**   Type: **POSTER**

Development of a MAPS detector prototype for the BESIII inner drift chamber upgrade

Sunday, 10 December 2017 20:50 (1 minute)

A three layers MAPS (monolithic active pixel sensor) detector prototype, 1/10 coverage of the BESIII (Beijing spectrometer III) inner tracker, is select as one of the pre-research schemes of the BESIII inner drift chamber upgrade, due to its quite attractive features of low material budget, low power consumption and high spatial resolution. We present the design, the construction and the test of the ladder which is the basic building block of the detector, consisting of 10 Mimosa28 chips thinned to 50μm, a flex cable and a carbon fiber supporter. The design and the development of the electronics are introduced as well. A probe test system for good chips selection was set up to complete the chip functional check and preliminary performance test before the construction of the ladders. A platform was designed and manufactured for the construction of the ladders. Using this platform, precise location of the chips and gluing the flexible cable to the carbon fiber supporter and to the chips were achieved. The material budget of the whole ladder with the carbon fiber composite supporter is about 0.5% $X_{\circ}$, and the average precision of the chip location is better than 10μm. The tests of the ladders have been carried out. Both the ladder and the readout electronics work well. The preliminary results are consistent with the expected ones, which provide a good foundation for the further study of the detector prototype.

Primary author: Dr DONG, Mingyi (Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China)

Co-authors: Dr JU, Xudong (Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China); Prof. OUYANG, Qun (Insitute of High Energy Physics, CAS, Beijing, China); LU, Xiaoxu (Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China); TIAN, Xingcheng (Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China); MA, Xiaoyan (Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China); Dr DONG, Jing (Institute of high energy physics, CAS, Beijing, China); QU, Chaoyue (Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China); Prof. ZHANG, Hongyu (Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China); Dr WU, Linghui (Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China); Prof. JIANG, Xiaoshan (Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China); Prof. WANG, Meng (Shandong University, Jinan,China)

Presenter: Dr DONG, Mingyi (Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China)

Session Classification: POSTER

Track Classification: Large scale applications