



Poster session 1 - Monday 4 July

P1.010 Mechanical characteristics of new photodetectors and covers for Hyper-Kamiokande

S Nakayama¹, Y Nishimura¹, H-K Tanaka¹, T Yano², J Kameda¹, M Shiozawa¹, Y Okajima³ and D Fukuda⁴

¹University of Tokyo, Japan, ²Kobe University, Japan, ³Tokyo Institute of Technology, Japan, ⁴Okayama University, Japan,

on behalf of The Hyper-Kamiokande proto collaboration

The Hyper-Kamiokande detector is proposed as a next generation underground water Cherenkov detector having an enormous potential to discover leptonic CP violation in neutrino oscillations and proton decays. The detector will consist of two cylindrical water tanks, each with a height of 60m and a diameter of 74m. The innermost main water volume of each tank will be viewed by 40,000 new 50cm photosensors developed for Hyper-K.

Since the new photosensors have to withstand the water pressure at a depth of 60m, 1.5 times deeper than the Super-K tank, they are designed to have much higher pressure tolerance than that of the Super-K PMTs. The result from the hydrostatic pressure test of 100 samples shows that the new 50cm photosensors have enough mechanical strength for the safe use in a 60m deep water tank.

To prevent a chain reaction of imploding photosensors caused by the unlikely event of a single photosensor implosion, every photosensor will be housed in the shockwave prevention cover. The prototype cover consists of an acrylic front window and a stainless steel backside cover. A mock test simulating the event of a photosensor implosion in Hyper-K has demonstrated that the peak amplitude of the pressure shockwave was significantly reduced outside the cover for the imploded photosensor and thus could not cause a chain reaction.

The demonstrations of mechanical characteristics of the new 50cm photosensors and protective covers will be presented.