A few words on my selected publications. Jingbo Ye, 2011

In the past few years I have mainly been involved in the ATLAS upgrade program for the high luminosity LHC, in particular in the R&D projects at SMU to answer the challenges of developing a radiation tolerant optical link with a data rate of 10 Gbps for each fiber, and an aggregated data bandwidth of about 100 Gbps for each front-end board. So far I am not aware of any other R&D projects in the HEP community that are working on data transmission from detector front-end at this data rate. The concurrent project is the GBT development led by CERN, on bidirectional data transmission at a serial data rate of 4.8 Gbps. In the R&D project at SMU, we need to meet two challenges: a serializer ASIC that can run at 10 Gbps, and an optical interface (laser driver ASIC, and laser diode) that can couple with ribbon optics. With intense R&D efforts in the past few years, we have identified a thin-film silicon-on-sapphire CMOS technology suitable for the ASIC development, and succeeded in prototyping a serializer IC that runs at 5 Gbps, and a phase-locked-loop (PLL) at 5 GHz for clock synthesizing of 10 Gbps circuits. Based on these successes, we are now designing array serializers and laser drivers with a design speed of 8 Gbps. The goal is to reach 10 Gbps in 2012 – 2013. On the optical interface front, we started out in the collaboration, the Versatile Link, an ATLAS-CMS common project, to develop a radiation tolerant optical interface working at 5 Gbps. In this project, we also evaluate other components, such as optical fibers in radiation environment. Based on the experience from this common project, we collaborate with FNAL and a few other institutions in the US to send in a proposal in the DOE generic detector R&D program to develop the optical interface with fiber ribbons at an aggregated speed of 120 Gbps.

For about a year now, I have also been involved in the LBNE/LArTPC R&D to develop an ultra-reliable detector front-end data link that will operate inside liquid argon for the design lifetime (15+ years) of the detector without access for repairing. The R&D work is concentrated on semiconductor circuit designs for cryogenic environments, and in particular an optical link system with its transmitting side submerged in liquid argon.

The 6 papers I selected for you reflect the above mentioned work which I felt was technically challenging, and I take pride in this research.