Dear All,

A short summary from 33rd Hardware WG meeting:

The meeting was devoted to radiation-hard sensors for BeamCal, with Bruce (UCSC) and Vladimir (JINR) showing their results on irradiation of various sensors. There was too much material to summarize it briefly, so please look into the slides. Here only very generic info:

- main results were on Si a GaAs sensors irradiated up to several hundreds Mrads or more, although Bruce showed also example results with Sapphire and Silicon Carbide sensors

- Bruce irradiated sensors using experimental radiation mix (electrons showering on several tungsten plates)

- Vladimir showed results from pure 20MeV electrons (the plan is to continue also with neutrons)

- Bruce and Vladimir showed results at different temperatures

- as it is known, the main weakness of Si is huge increase of leakage current (and so noise), while for GaAs significant drop of signal

- the results from Bruce measurements and his FLUKA simulations seem to point to neutrons (produced during showering) as the main reason of displacement damage (high leakage current), but it is very preliminary conclusion....

Both presentations show that in principle either GaAs or Si can be used as BeamCal sensors. At present there is not enough data (but also the proper readout setup) to compare precisely S/N ratio at different irradiation levels for Si and GaAs sensors. For Si, to maintain good enough S/N ratio, cooling to negative temperatures is needed.

At the end of the meeting Yan started a discussion about readout system for 2018 test-beam. Since new readout system (with FLAME chip) will probably be integrated only on limited number of detector planes (because of short time and man-power limitations), a parallel readout would be needed if we want to read all planes. The APV chip used in last test-beam has very small signal range (<8MIP). Yan started to look at SKIROC chip+acquisition system, which is used in ECAL. To be continued...

Best Regards,

Marek