BLM Considerations

Talking points

Thu, Feb 22, 2001

There is a pair of indices that are parameters to the BLMS local application that identify the portion of the BLM waveforms covered by the long term running average calculation. How should these be set?

For the millisecond differential double precision sums, it would be desirable not to depend upon the above indices, since these sums may never be reset, at least during an extended accelerator operations running period. If there were such a dependency, it would complicate the interpretation of the archived sums.

Another factor that could influence the waveform data is the delay register that is part of the Swift digitizer hardware. If that changes, the waveforms immediately look different. It would be better if the delays would not change or if the scheme for generating the sums did not depend upon the delays in use.

Current thinking is to start at the beginning of the waveform and sample the readings every millisecond, which is every 12–13 points, compute the differential loss, and accumulate the resultant losses into double precision sums. The first sum would therefore relate to the loss during the first millisecond, etc. The 35th sum would represent the loss during the 35th millisecond that is derived from the samplings at 35 and 36 ms from the start of the waveform. I intend to accumulate a total loss for the 36th sum. This would involve comparing the loss readings from the first point of the waveform with the point sampled at 36 ms—the same point that was used to compute the last differential sum. Is this scheme agreeable?

The beam charge also is to be summed. Where do I obtain this signal? My understanding is that it would represent a different kind of thing. I propose to simply accumulate these in the engineering units that are used—hopefully linearly scaled to the raw A/D reading.

There will also be sums for clock events. Both the sums of beam charge and the sums of clock events will be accumulated in a single node, or in two different nodes. They will both have to be double precision arrays.

In the end, there should be new devices DABBELed into the Acnet database, one for each BLM to access (by the shrewd use of offset values) the 36-point sum arrays for each of the 10 clock events in use. In addition, there should be one for the beam charge sums and one for the clock event sums.

The present support in BLMS accommodates only a single formula for computing beam loss in rads/sec from the raw log-amplifier signal reading. I think it would be difficult to accommodate more than one formula. It would also make it difficult in practice to exchange hardware in the field. I very much hope that the BLM hardware can be made to have the same characteristics.