Topics to discuss with John Womersley

Outline areas in which we want to continue generic detector development studies:

1. Detector R&D using CMOS sensors. (Paul Dauncey, Marcel Stanitzki, Mike Tyndel, Jaap Velthuis, Steve Worm...). This project would build on the current research programmes of LCFI and CALICE. INMAPS technology, developed initially in the UK to build large area pixel sensors for digital calorimetry, also has the potential to provide pixels for large area tracking. The application of ISIS to particle tracking is also a UK development which also uses the same deep p-well technology and has the potential to provide pixels for large area tracking as well as for vertexing. We propose a generic development program of these concepts which would deliver both small and large area pixels for future tracking and calorimetry applications. By combining the initiatives from LCFI and CALICE, we will achieve economies in terms of testing and in terms of the relationships with potential vendors. This bid is likely to cost £1.4M per year for 3 years
2. DAQ (Dave Bailey, Matthew Wing...). Develop DAQ systems with emphasis on maximum use of "off-the-shelf" components for future detectors, e.g. SLHC, LC...
3. Novel materials for low mass detectors (Joel Goldstein, Tim Greenshaw...). Study properties of new materials, in particular silicon carbide and other foams, which could be used for construction of new very light vertex detectors at SLHC and elsewhere.
4. Physics (Victoria Martin, Marcel Stanitzki, Andrei Nomerotski, Mark Thomson...). Interest is further development of new techniques (particle flow, vertexing algorithms), study of their application in the context of detectors for the LC and at other facilities.

Problems to discuss:

Would the STFC like to see one coherent proposal combining all (or at least a large proportion) of the sensor work as above, or a set of smaller PRD-like proposals? For example, smaller PRDs could cover aspects of the sensor package above:

1. Tracking calorimetry with INMAPSs as active component (Paul Dauncey...). Investigate performance and costs of INMAPS-based high spatial resolution calorimeter.
2. Test of ISIS2, design and manufacture of new ISIS (Andrei Nomerotski, Steve Thomas, Gary Zhang...). Complete testing of ISIS2 and use results to design next generation of ISIS with possible applications in vertexing and tracking as well as burst imaging.

There are problems with the large package: it is not focussed on a particular detector and it is (in the current climate) expensive and therefore unlikely to find favour with the PPRP. The degree of overlap between the issues that must be solved for different applications e.g. calorimetry and vertexing, is also limited, although many of the basic technologies are shared. Calorimetry might be better tackled using a separate grant, ditto vertexing, but neither of these will fit easily into the PRD framework: the amount of funding is too small.

We need clarification as to how much funding might be available (at least roughly).

We need to understand whether the SLHC funding is separate from the funding we will be accessing, as some of the above (novel materials, DAQ) are relevant to SLHC.

Marcel Stanitzki and Mark Thomson have already submitted a PRD proposal that has been reviewed by the PPRP PRD panel. What is the status of this and how should new physics bids relate to this?

We also some guidance on what is meant when PPAN, SB and Council refer to “future colliders”. If the current feeling is that there will be no big detector build for 20 years apart from the SLHC, then we need to know this, even if we disagree with it!