

## Minute of the MCC-DSM Design Meeting held on 21<sup>st</sup> of February 2003

(Periodic meeting on MCC project progress)

**Present:** *Roberto Beccherle, Giovanni Darbo, Guido Gagliardi, Paolo Morettini, Carlo Schiavi.*

### **MCC-I2.**

Status of MCC-I2 specs and implementation: The design and test is in progress. There where some new issues concerning design implementations. In particular on:

- *Parity:* The FE does the following to calculate the parity it transmits in the Hits or in the EoE word:
  - For each hit, the calculation determines a HitParity bit to be the EXOR of all bits Hit<20:0>, excluding Hit<7> which is the parity bit itself. The result will be that after the HitParity bit is calculated, the EXOR of all 21 bits in the range Hit<20:0> will be zero. The parity bit itself can then take on whatever value is necessary to give this result.
  - The same is true for the EoEParity bit located in EoE<12>. This is calculated using the other 20 bits of EOE<20:0>, namely the BCID<7:0>, L1ID<3:0>, and Flag<7:0>. The EoEParity bit is calculated after all the error flags have been stored, and includes them in the parity calculation.
  - In addition, one of the Flag bits is HitParityError, which is calculated by doing the parity check for each Hit (and not for the EoE itself). A cumulative OR is done of each HitParity (the EXOR of Hit<20:0>), and if any of them have the value one, there will be a flagged HitParityError in the EOE Flag word. The parity transmitted from the FE both in the hit and in the end-of-event word is the parity of the transmitted word.

It is not clear whether it is worth or not to make a parity check in the Hits and EoE and to add a generated flag to the MCC output data.

- *Hit and EoE in ReceiverFIFO:*

Four bits (HEPW – Hit/EoE/Parit/Warning) are used to encode Hit or EoE words, and, in case of EoE, also the presence of Warning and the value of parity from FE are encoded. The encoding is such that there is at least a hamming distance of two between Hit and EoE.

  - HEPW = 0000 (read 0000 | 1000 | 0100 | 0010 | 0001) : Hit.
  - HEPW = 0111 : EoE no Warning no Parity. Single bit flip □ EoE with Warning.
  - HEPW = 1011 : EoE no Warning with Parity. Single bit flip □ EoE with Warning no Parity.
  - HEPW = 1101 : EoE with Warning no Parity. Single bit flip □ EoE with Warning no Parity.
  - HEPW = 1110 : EoE with Warning and Parity. Single bit flip □ EoE with Warning no Parity.

### **Module test.**

We feel that we are missing tools for system debugging of a module. After discussion we decided to design an adapter card that intercepts CK, DCI and DTO/DTO2 lines from TPCC to TPLL and to bring them to the MCCex. In this way it is possible to operate the module either in the lab or in the test beam with standard hardware. SimPix will be adapted to work with a module.