WP3-3
IP blocks

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WP3-3 task (I)

Work-package title : Shareable IP blocks for HEP

- Goal : provide 2 lots of IP blocks for the HEP needs with full documentation and laboratory tests

- Lead institutions : CERN + LAL
  - Choose the best techno at best price (MPW center)
  - Provide efficient interface between designers and MPW center
  - Gather the different designs to send them to MPW center
  - Centralize the documentation of blocks and test results
  - Organize users meeting

- Other participant labs : AGHT-UST, IRFU, LPNHE

- Associated labs : INFN-Mi, INFN-Pv, U Bonn, others ?

WP3-3 task (II)

- 1srt set of IP blocks :
  - managed by CERN : Alessandro Marchioro
  - electronics for trackers
  - Radiation hardness
  - Technology : CMOS 65nm

- 2nd set of IP blocks :
  - Managed by LAL
  - Electronics for calorimeters and TPCs : high dynamic range, low noise, low offset, need of precise capacitors and resistors, …
  - Blocs : ADC, TDC, DAC, Bandgap, OTA, Rad-tol memory, SEU resistant flipflop …
  - Technology : SiGe 130nm or 350 nm ? (IBM, AMS …)
  - MPW center : depend on techno (CMP, MOSIS …)

WP3-3 milestones

- Milestones and deliverables for 2nd set of IPs:
  - blocks (SiGe) due for month 44 (September 2014)
  - Characterization of these blocks before month 48 (January 2015)

→ 1 year to choose technology

SiGe technologies (I)

- AMS 350 nm :
  - Price : 890€/mm2 (min. 4mm2)
  - 4 MPW runs / year by CMP
  - 4 Metal (one thick) – 2 poly – Cmim and Cpoly – Hres
  - power supply : 3.3V or 5V
  - Bipolar : Ft=65 GHz – Beta= 200
  - I/O cells, digital cells, RAM ..
  - Time of life, duration : 10 years

- IBM 130 nm :
  - Price : ?
  - 3 MPW runs / year by MOSIS
  - 5 Metal (1thick) – 1 poly – Cmim
  - power supply : 1.2V - 2.5V (I/O)
  - Time of life, duration : many years

SiGe technologies (II)

- ST 130 nm :
  - Price : 3500€/mm2 (min. 1mm2)
  - 4 MPW runs / year by CMP
  - 6 Metal – 1 poly – Cmim
  - power supply : 1.2V or 2.5V (option)
  - Bipolar : Ft=150 GHz – Beta=1000 – MOS : low VT
  - digital cells (VHDL)
  - Time of life, duration : 2 years !

- IHP 130 nm :
  - Price : 7200€/mm2 (min. 3mm2)
  - 3 MPW runs / year by europractice
  - 5/7 Metal (1thick) – 1 poly – Cmim
  - power supply : 1.2V - 2.5V (I/O)
  - Bipolar : Ft=300 GHz – MOS : low VT
  - Time of life, duration : many years ?

AIDA WP3-3 schedule and money for SiGe lot

- Money :
  - AIDA provided only 67k€ :
    - AMS SiGe 350nm costs 900€/mm2 by MPW center !
    - SiGe in 130nm → 7k€/mm2 → only 10 mm2
  - Partners are welcome but with additional money.

- Schedule :
  - Let one year to choose the best technology in SiGe
  - All partners must meet (EVO meeting) during this year :
    - To decide which technology must be used
    - To propose blocks
  - Blocks must be submitted at the beginning of 2014 et least