

FTK Italia — Situazione 2015 e richieste 2016

Valentino Liberali

INFN Milano and Department of Physics, Università degli Studi di Milano
Via Celoria, 16
20133 Milano
Italy

`valentino.liberali@mi.infn.it`



Istituto Nazionale
di Fisica Nucleare

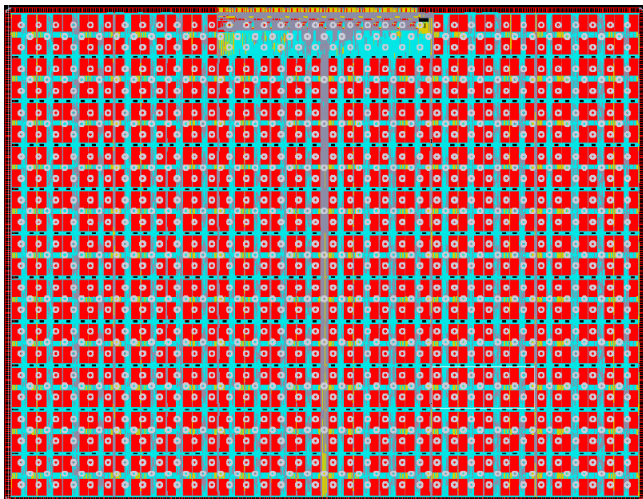


UNIVERSITÀ
DEGLI STUDI
DI MILANO

ATLAS Italia, Luglio 2015

- AMchip06 submitted for fabrication
- AMboard redesigned
- cooling improved
- interface mezzanine redesigned
- now working on test (≈ 200 AM chips to be tested asap) and on software

AM chip v. 06: submitted

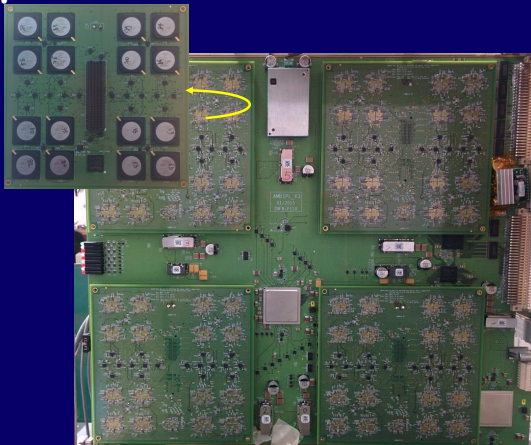


Floorplan of the AM chip: 168 mm², 421 M transistors

AM board – from Saverio Citraro's presentation

AMBSLP

- Serial Links
@ 2Gb/s
- VME 9 U
- Clock
@ 100MHz
- Supply
Voltages:
2,5V
1,8 V
1,2V
1V
- Power
consumption:
~ 250 Watt

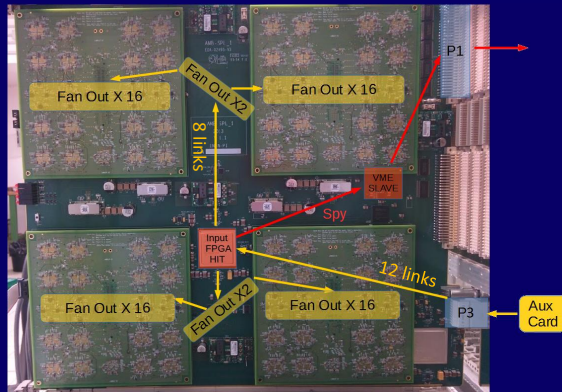


AM board – from Saverio Citraro's presentation

AMBSLP

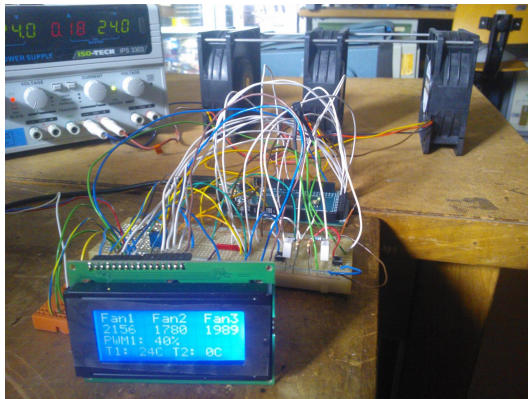
AMB distributes SSs to 64 AMchips

- Serial Links
@ 2Gb/s
- VME
- Clock
@100MHz
- Supply
Voltages:
2,5V
1,8 V
1,2V
1V
- Power
consumption:
~ 250 Watt



Fan tray project – Demonstrator

To the right the demonstrator of the functionality of the project, composed of the final display, a connectivity breadboard, the Arduino μ controller and three final fans. The displayed parameters are the generated by the written firmware running on the Arduino

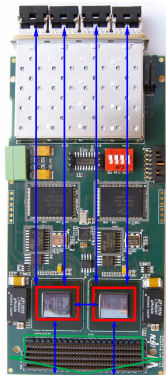


New input mezzanine – from Matteo Beretta's presentation

Nuove mezzanine con FPGA Artix (non previste inizialmente)

Outline

- Test Procedure:
 - GTP
 - FMC
 - Memory
 - Temperature
- Test Report
- Prototype Status
- Firmware Porting Report
- Production Test
- Schedule
- Conclusion



Artix7-IM

FTK simulation performed by Frascati, Pavia, Pisa

2015 Budget for AMchip06

Finanziamenti per il 2015:

Voce	Assegnato	SJ	Totale	Note
Produzione di 50 wafer di AM06 Totale per Milano	20 000	200 000	220 000	SJ AM06 testato e funzionante
Test di AM06 Totale per Frascati	100 000		100 000	di cui 15 000 spesi per IM con Artix disponibili 85 000

Note:

- 1 Sblocco SJ a settembre per poter trasferire i fondi al CERN entro fine anno; il trasferimento e l'ordine di produzione dei 50 wafer saranno fatti comunque dopo il successo del test di AM06.
- 2 Inizialmente era previsto che Frascati facesse le mezzanine con FPGA Spartan; ma la complessità del firmware ha richiesto di usare FPGA con capacità di calcolo maggiore (non compatibili con le Spartan), e quindi sono state progettate le nuove mezzanine con FPGA Artix, pagate sull'assegnazione per il test di AMchip.

2016 human resources

Sede/nome	FTK	FTK-II	IMPART	Totale
Matteo Beretta	0.70			0.70
Pietro Albicocco	1.00			1.00
Mario Antonelli	0.10			0.10
Marianna Testa	0.25			0.25
Totale FRASCATI	2.05	0.00	0.00	2.05
Attilio Andreazza	0.20			0.20
Valentino Liberali	0.10	0.20		0.30
Seyedruhollah Shojaii	0.20		0.30	0.50
Alberto Stabile			1.00	1.00
Totale MILANO	0.50	0.20	1.30	2.00
Agostino Lanza	0.30			0.30
Andrea Negri	0.40			0.40
Valerio Vercesi	0.30			0.30
Totale PAVIA	1.00	0.00	0.00	1.00
A. Annovi	0.70	0.30		1.00
R. Beccherle	0.30	0.20		0.50
F. Bertolucci	0.70			0.70
N. Biesuz	0.20		0.30	0.50
S. Citraro	0.30	0.30	0.40	1.00
M. Dell'Orso	0.50	0.50		1.00
S. Donati	0.70			0.70
P. Giannetti	0.90	0.10		1.00
S. Gkaitatzis	0.50			0.50
P. Luciano		0.20	0.80	1.00
M. Piendibene	0.58		0.42	1.00
C. Roda	0.20			0.20
C. Sotiropoulou		0.50	0.50	1.00
G. Volpi	0.30	0.20		0.50
Totale PISA	6.38	2.30	1.92	10.60
Totale FTK Italia	9.93	2.50	3.22	15.65

Synergies: RD_FASE2 (TrackTrigger for ATLAS/CMS), IMPART (AMchip07 in 28 nm)

2016 responsibilities

Nome	Responsabilità	Livello	Mesi
Alberto Annovi	FTK Project Leader (management)	L1	6
Paola Giannetti	Technical coordinator FTK (management)	L2	2
Saverio Citraro	LAMB responsible	L3	2
Marco Piendibene	AMB responsible	L3	1
Guido Volpi	Software coordinator (management)	L3	2
Calliope Louisa Sotiropoulou	Monitoring firmware	L3	1
Matteo Beretta	IM Artix e Test di AMchip06	L3	2
Valentino Liberali	Test di AMchip06	L3	2
Agostino Lanza	Responsabile servizi NSW	L3	1
Andrea Negri	Interface to HLT and TDAQ operations	L3	1
—	Installazione e commissioning FTK	—	15
Totale FTK Italia			35

FTK schedule

- **1st step** combination of **production & prototypes boards**
- **2nd and 3rd steps** all boards from production except AM board

Success
oriented

	IM	DF	AUX	AMB	AM ver.	SSB	FLIC	Milestones	Expected
1st	4→16	1→4	1	1	05	1	1	Included in TDAQ	09/2015
2nd	128	32	16	1	05	1	2	Included in TDAQ	11/2015
3rd	128	32	16	1	06	8	2	Included in TDAQ	12/2015
4rd	128	32	16	16	06	8	2	Full barrel (mu=40)	03/2016
5th	128	32	32	32	06	16	2	Full detector (mu=40)	09/2016
Final	128	32	128	128	06	32	2	TDR Specs	2018 / Lumi driven

Plan for the rest of 2015 is to:

- Commission full Input and Output (all IMs, DFs and FLICs)
- Commission full I/O plus a AUX-AMB-SSB processing slice

22

2016 expected costs

Expected costs for 2016:

Pisa:	
AMB production (50% of total boards)	150 000
extra costs of AM06 package	4 000
Totale Pisa:	154 000
Frascati:	
Prima produzione prototipi FTK IM Artix	9 815
Produzione schede di test AMchip05	3 672
Seconda produzione prototipi FTK IM Artix	8 180
Totale Frascati:	21 667
Pavia:	
Ansys Icepack licence	3 000
Totale Pavia:	3 000

FTK budget problem: AM chip must be paid in US\$

Previous change rate was 1 € = 1.243 CHF and 1 \$ = 0.957 CHF

Now € ≈ CHF ≈ \$