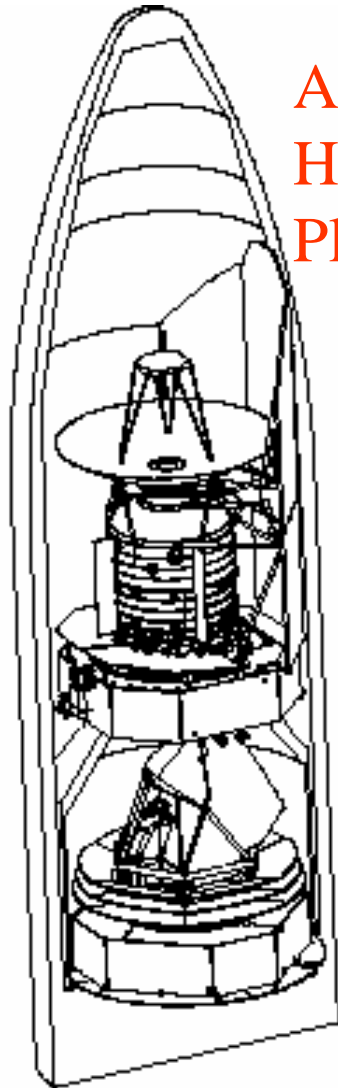


Développement du logiciel DPU de Planck

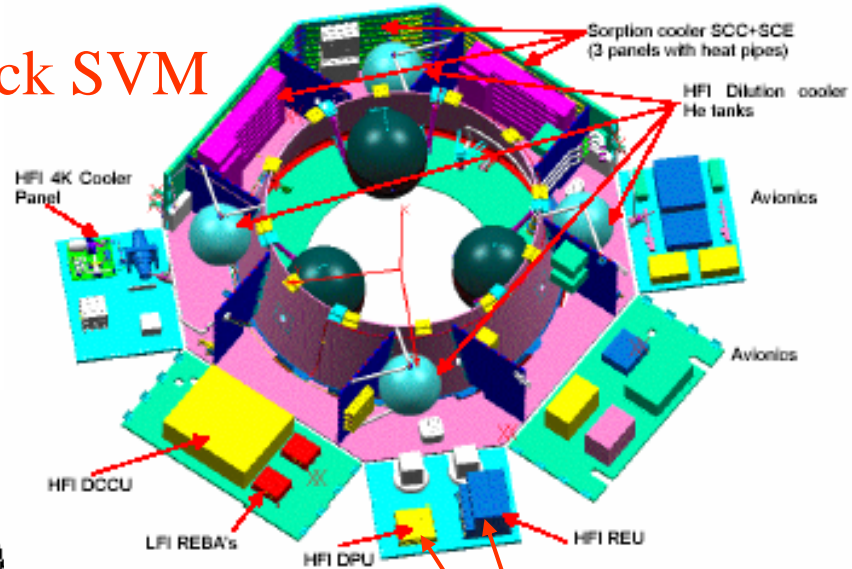
Michel Dehamme
et Jean-Claude Marrucho

ME/DPU Localisation

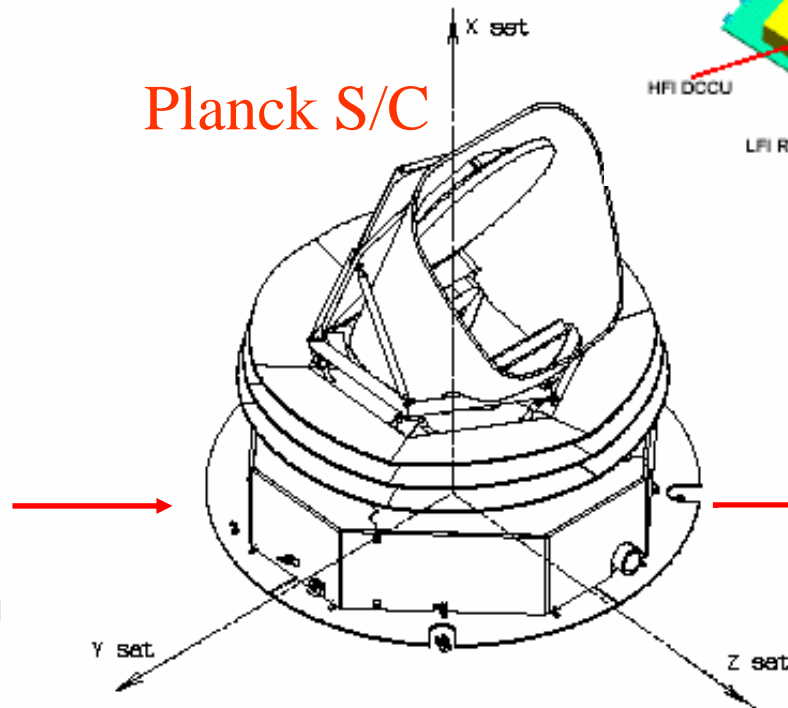
Ariane5 +
Herschel-
Planck



Planck SVM

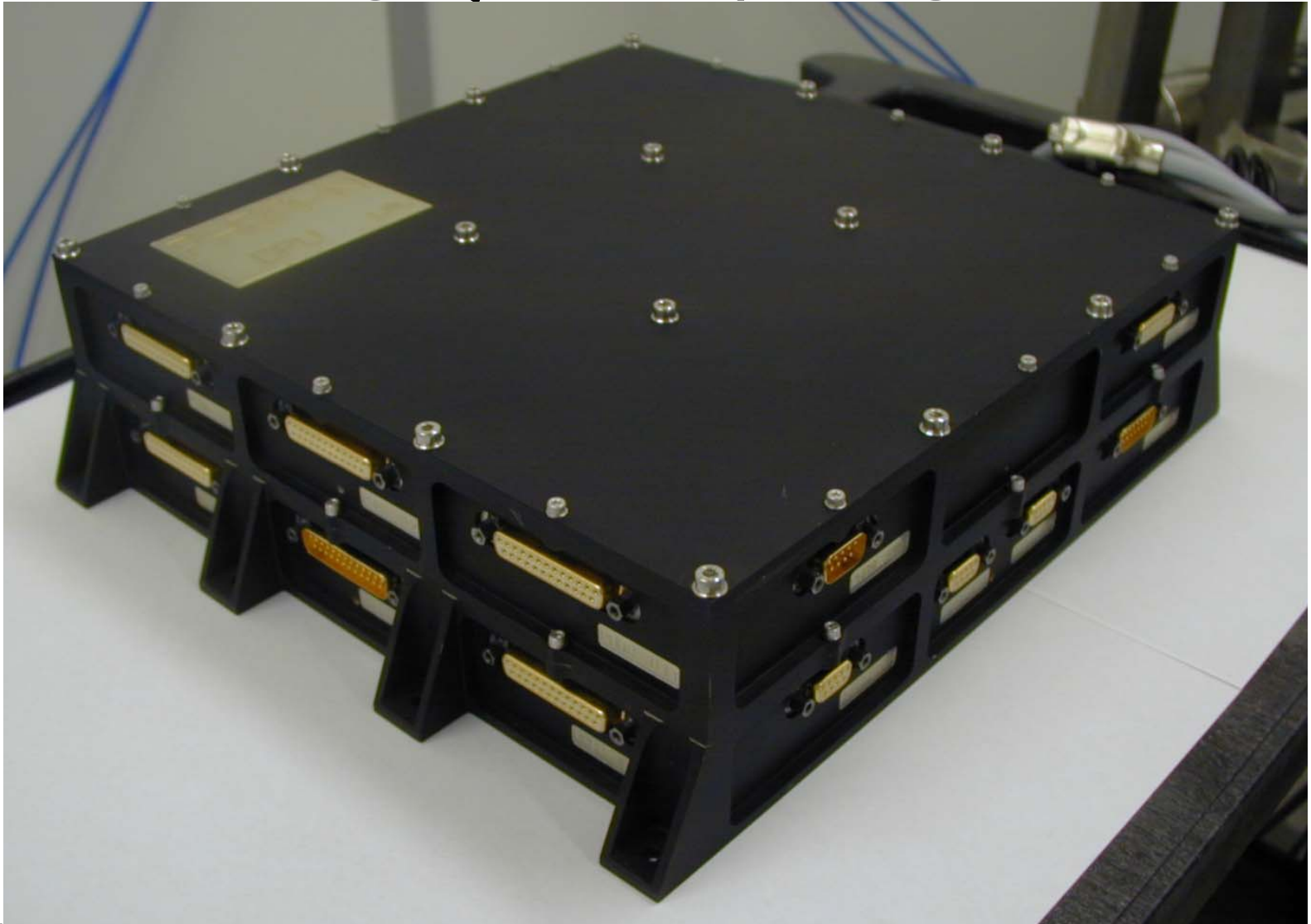


Planck S/C



HFI ME/DPU
Prime and
Redundant

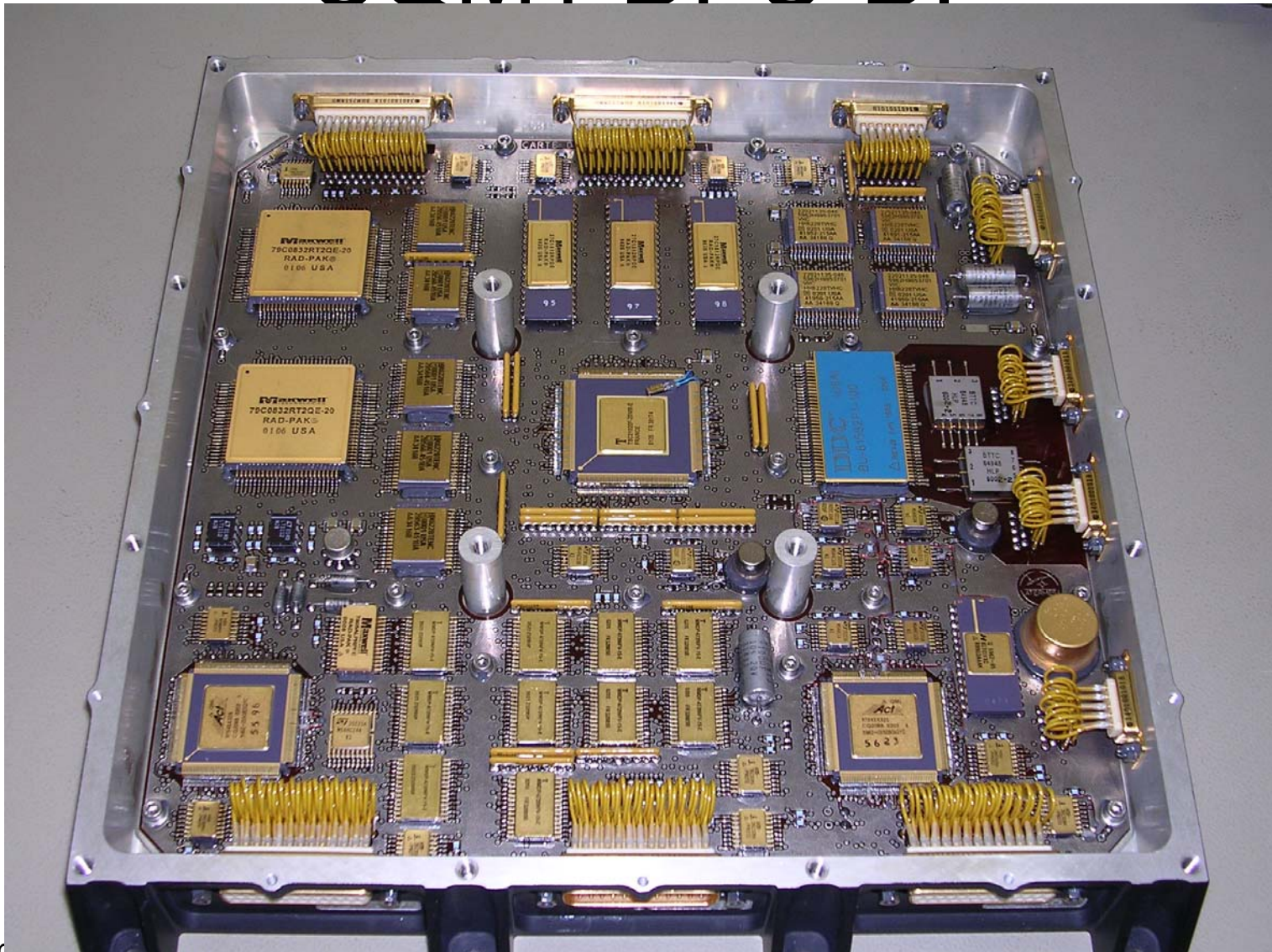
CQM ME/DPU



21 mars 2006

Developpement durable

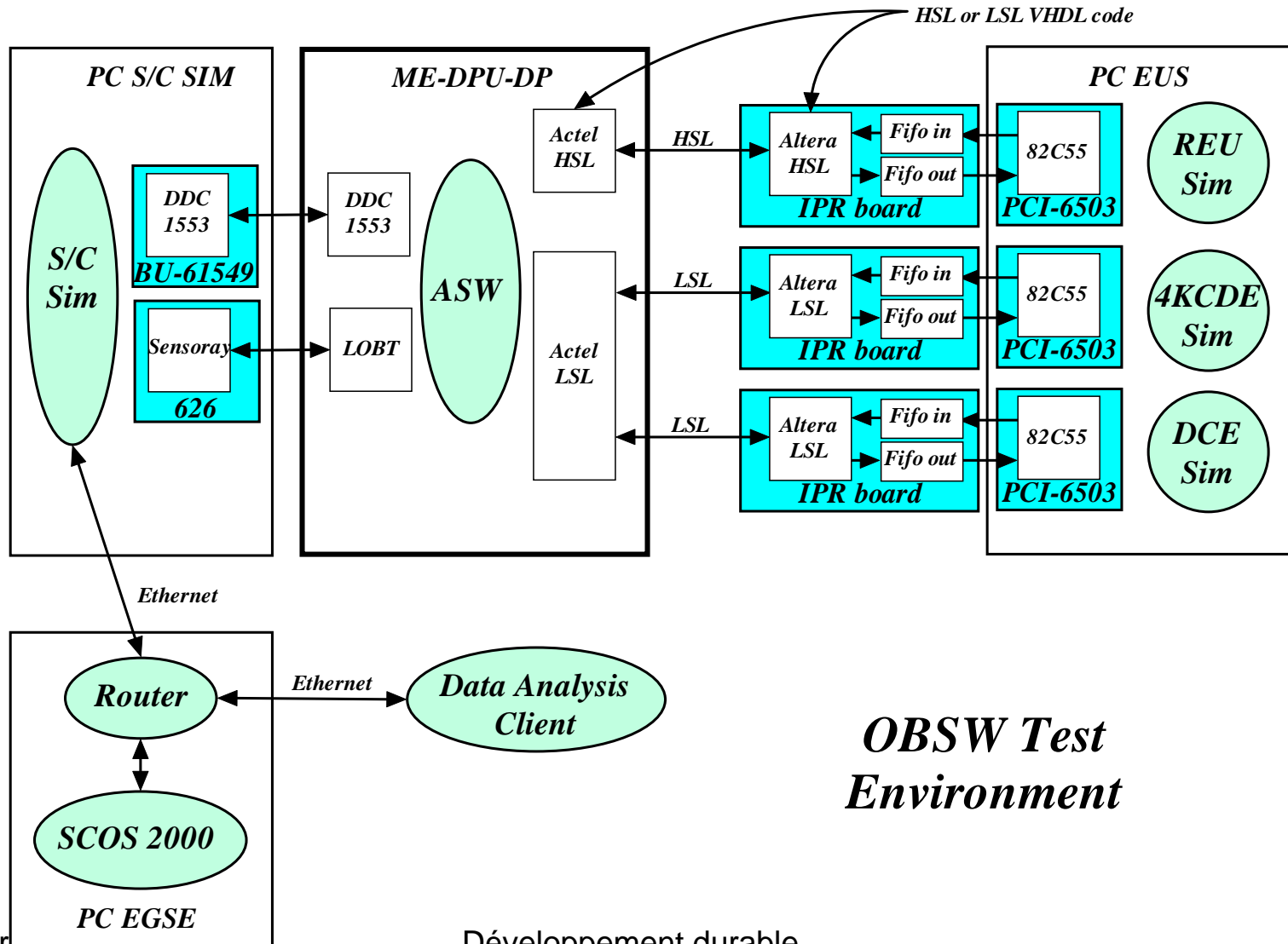
CQM1 DPU-DP



21 mars 2006

Development d'archive

Test environment at S/S level



TFL1553

LIBRARY

- **COMMON LIBRARY C SOURCES :**

TFL1553.C	TFL1553.H
TFL1553BC.C	TFL1553BC.H
TFL1553R.C	TFL1553R.H
TESTLIST.C	TESTLIST.H

- **NT/XP SIDE : use of Microsoft VisualC 6.0 compiler**

BC user mode:	SIM.EXE :	SIM.C
RT user mode:	MEDPU.EXE :	MEDPU.C

TFL1553.LIB

- **DSP SIDE : use of Analog Device g21k 3.3 compiler**

library sources for hardware ACE 1553 access

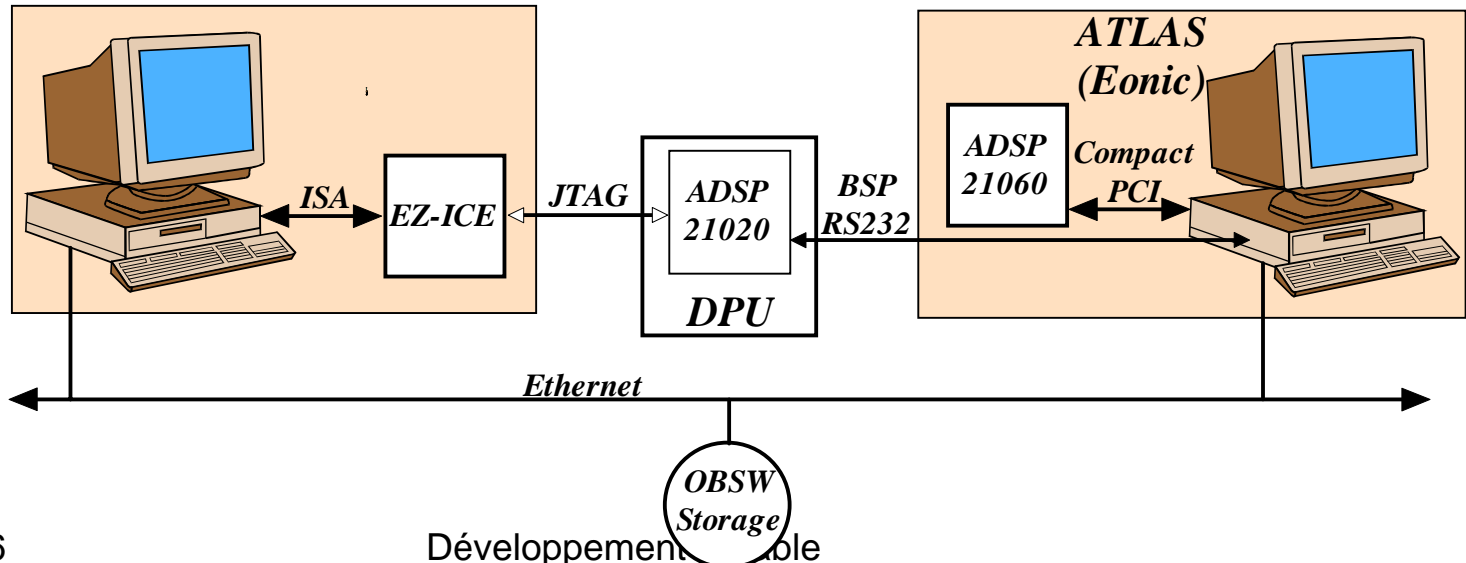
RT user mode only:	TASKMAIN.C	TESTDPU4.EXE (*)
--------------------	------------	------------------

LIBTFL.a

(*) use of RT Kernel for DSP :

OBSW Development environment

- EZ tools (Analog Devices) at processor level (through JTAG)
 - Virtuoso gives standard tools of a Multi-task OS (task, semaphore, etc..)
 - Virtuoso Monitoring tools (Eonic) at RTK level:
(Communication with BSP through RS232)
 - Development of ASW on 21060 target with partial simulation of Hardware. *Loader and DSP debugger*
- ASW simulator (on 21060)
+ RTK monitoring through BSP*



ADSP-21020 Emulator

Core Memory Execution Window Help

Data Memory (hex, dmadr)

```

-- [00002b89] _WldTicks: 0000000000
-- [00002b8a] _WldRefT: 0000000000
-- [00002b8b] _WldT0: 0000000000
-- [00002b8c] _WldT1: 0000000000
-- [00002b8d] _WldN0: 0000000000
-- [00002b8e] _WldN1: 0000000000
-- [00002b8f] Wld i: 0000000000
-- [00002b90] _TmIndexW: 0000000000
-- [00002b91] _TcIndexR: 0000000000
-- [00002b92] _NB_TM_in_Fifo: 0000000000
-- [00002b93] _NB_TC_in_Fifo: 0000000000
-- [00002b94] _SptrStart: 0000000000
-- [00002b95] _k_Q2: 0000000000
-- [00002b96] 0000000000
-- [00002b97] 0000000000
-- [00002b98] 0000000000
-- [00002b99] 0000000000
-- [00002b9a] 0000000000
-- [00002b9b] 0000000000
-- [00002b9c] 0000000000
-- [00002b9d] 0000000000
-- [00002b9e] 0000000000
-- [00002b9f] 0000000000
-- [00002ba0] 0000000000
-- [00002ba1] 0000000000
-- [00002ba2] 0000000000

```

Mode2 Status

```

MODE2: 10008000
irq0e: 0 flg0o: 1 cadis: 0
irq1e: 0 flg1o: 0 cafrz: 0
irq2e: 0 flg2o: 0 timen: 0
irq3e: 0 flg3o: 0 sirev: 1

```

Arithmetic Status

```

ASTAT: 00100000
az: 0 mn: 0 sv: 0 btf: 0 cacc0: 0
av: 0 mv: 0 sz: 0 flg0: 0 cacc1: 0
an: 0 mu: 0 ss: 0 flg1: 1 cacc2: 0
ac: 0 mi: 0 flg2: 0 cacc3: 0
as: 0 flg3: 0 cacc4: 0
ai: 0 cacc5: 0
af: 0 cacc6: 0
cacc7: 0

```

target Running

Cqm - COM1 VT

File Edit Setup Control Window Help

```

TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
07/1
28/0
14/0
14/0
14/0
13/0
05/0
03/0
03/0
03/0
14/1
15/1
05/0
KSST:00000000
MC:0000C290
SSCBk FFFF
F17B
Hs1CSLost
SSCBk 0001
F17D
Hs1BadCS

```

Interrupt

EasyCalculator

gswin

hfi

Patch_Calculator...

DevBack

Dsp21k

Hpfonts

Jl

Patc

Data Memory (hex, dmadr)

```

--- [00002b89] _WldTicks: 0000000000
--- [00002b8a] _WldRefT: 0000000000
--- [00002b8b] _WldT0: 0000000000
--- [00002b8c] _WldT1: 0000000000
--- [00002b8d] _WldN0: 0000000000
--- [00002b8e] _WldN1: 0000000000
--- [00002b8f] _Wld_i: 0000000000
--- [00002b90] _TMindiceW: 0000000000
--- [00002b91] _TCindiceR: 0000000000
--- [00002b92] _NB_TM_in_Fifo: 0000000000
--- [00002b93] _NB_TC_in_Fifo: 0000000000
--- [00002b94] _SptrStart: 0000000000
--- [00002b95] _k_Q2: 0000000000
--- [00002b96] 0000000000
--- [00002b97] 0000000000
--- [00002b98] 0000000000
--- [00002b99] 0000000000
--- [00002b9a] 0000000000
--- [00002b9b] 0000000000
--- [00002b9c] 0000000000
--- [00002b9d] 0000000000
--- [00002b9e] 0000000000
--- [00002b9f] 0000000000
--- [00002ba0] 0000000000
--- [00002ba1] 0000000000
--- [00002ba2] 0000000000

```

Program Memory (asm, pc)

```

--- [00000002] nop;
--- [00000003] nop;
--- [00000004] nop;
--- [00000005] nop;
--- [00000006] nop;
--- [00000007] nop;
--- [00000008] lib RSTI: call lib setup;
--- [00000009] call __lib_setup_processor;
--- [0000000a] call __lib_setup_environment;
--- [0000000b] jump _main (db);
--- [0000000c] nop;
--- [0000000d] nop;
--- [0000000e] __lib_prog_term: idle;
--- [0000000f] jump __lib_prog_term;
--- [00000010] nop;
--- [00000011] nop;
--- [00000012] nop;
--- [00000013] nop;
--- [00000014] nop;
--- [00000015] nop;
--- [00000016] nop;
--- [00000017] nop;
--- [00000018] __lib_SOVFI: bit clr model 0;
--- [00000019] dm(i7,m7)=i13;
--- [0000001a] i13=dm(0x28d3);
--- [0000001b] bit set mode2 0x80000;

```

Mode2 Status

```

MODE2: 10000000
irq0e: 0 flg0o: 0 cadis: 0
irq1e: 0 flg1o: 0 cafrz: 0
irq2e: 0 flg2o: 0 timen: 0
irq3e: 0 flg3o: 0 sirev: 1

```

Arithmetic Status

```

ASTAT: 00100000
az: 0 mn: 0 sv: 0 btf: 0 cacc0: 0
av: 0 mv: 0 sz: 0 flg0: 0 cacc1: 0
an: 0 mu: 0 ss: 0 flg1: 1 cacc2: 0
ac: 0 mi: 0 flg2: 0 cacc3: 0
as: 0 flg3: 0 cacc4: 0
ai: 0 cacc5: 0
af: 0 cacc6: 0
cacc7: 0

```

Cqm - COM1 VT

```

File Edit Setup Control Window Help
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
TabSrvDef
InitSrvDef
CpSize:0064
DbSyncTab:0016
TC OK:C290
KSST:00000000
MC:0000C290
IdMess:8001
4DpTp:0000
TC OK:C291
KSST:00000000
MC:0000C291
TC OK:C292
KSST:00000000
MC:0000C292
SSCBk FFFF
r17B
Is1CSLost
SSCBk 0001
r17D
Is1BadCS
TC OK:C293
KSST:00000000
MC:0000C293
4IdMess:800F
4DpTp:0000

```

```

File Edit View Tools Help
[Icons]
conspawn C:/ADI_DSP/bin/g21k @cflags -o Scprod.o C:/Dev/dpu/ASW/Scprod.c
del task.a
dir *.* /b > cfiles.lst

```

Virtuoso System objects [IntegraP.vpf] Node view

Edit View Tree List Tools Window Help

System view

- System
 - Nodes
 - NODE1

Name	Type	Node	Details
CEILING_...	GLOBALPAR		value = 5
DATALEN	GLOBALPAR		value = 1024
DRIVER_...	GLOBALPAR		value = 0
KERNEL_...	GLOBALPAR		value = 0
TICKFREQ	GLOBALPAR		value = 1000
NLIFILE	NLIFILE		full path: C:\Virtuoso\Adi210
EXE	TASKGROUP		startup immediately: YES
FPU	TASKGROUP		startup immediately: NO
SYS	TASKGROUP		startup immediately: YES

NUM

```

.a
.exe -a dpu.ach -m

```

IntegraP.vpf | Object view

Window Help

Name	Type	Node	Details
DCE_DD...	SEMA	NODE1	
DPU_DD...	SEMA	NODE1	
KCODE_D...	SEMA	NODE1	
REU_DD...	SEMA	NODE1	
REU_IRQ...	SEMA	NODE1	
S_DPUHSC	SEMA	NODE1	
S_IRQ0	SEMA	NODE1	
S_IRQ1	SEMA	NODE1	
S_IRQ2	SEMA	NODE1	
S_IRQ3	SEMA	NODE1	
S_SERIA...	SEMA	NODE1	
TC_ARRI...	SEMA	NODE1	
TIMER_C	SEMA	NODE1	

NUM

at: 9, Selected: 0.

memory areas disabled

%ld21000 - Completed with 4

Generate Files Build

Ready

- Taskgroups
- MailBoxes
- Semaphores
- FIFO's
- Events
- Memory Pools
- Memory Maps
- Resources
- Drivers

Total: 15, Selected: 0.

NUM

BSW

How to make BSW

- Because some problem with batch file under XP, I use make.exe of Virtuoso environment
- Only three libraries : libtflwv.a libacelw.a (TFL without Virtuoso)
libPus.a (for PUS format)
- And principal program : bootv4r1.c
- Some tools for made PROM : spl21k (Three PROM)
- and a "moulinette" in order to correct a defect of the programmer of EEPROM

ASW

How to make ASW

- Use of Virtuoso environment on a specific licensed PC:
 - Compiler g21k
 - Makefiles
 - Rtos configuration
- 4 libraries :
 - 1553 library
 - Asw Objects library
 - Pus libraries (Tc & Tm)
- Load by Jtag using 21020 emulator tool or by programming the Dpu eeprom.

Unit tests

