The objective of the FOCS project is to specify, design and validate a Floating Point Unit (FPU) and its associated controller. This function constitutes an essential and mandatory building block for, as a reference the Corner Cube Electronics Equipment which is part of the IASI new generation instrument foreseen to be flown in the Meteosat Third Generation (MTG) satellite and in other missions like Post-EPS and PREMIER (see also SYDERAL strategic plan in the “Answer to the Guidelines” volume).

**FOCS controller selection: MBLITE (Microblaze compatible 32-bit CPU)**
- Full VHDL source code available on a LGPL license base
- Full GNU toolchain available with GNU compiler
The MBLITE implements only integer and logical execution units.

**FPU selection : EXECFOCS (totally new FPU, IMUL and BS unit)**
The FPU uses an open-source FPU core implementing FADDSUB, FMUL, FDIV, FSQRT. However, its resource exceeds the project requirement (85% of an RTAX1000, 3x more than required). So it was decided:
- To rewrite an FPU core from scratch, with low complexity and high performance
- To implement in this FPU all the floating-point instructions of the Microblaze (Float2int and Int2float conversions, 7 different Float comparisons)
- To implement also in this FPU support for integer arithmetic, implementing All the integer instructions of the Microblaze (except DIV) and the barrel shifter.

Project partners:
- SYDERAL
- Microelectronic Systems Laboratory (LSM) at EPFL