

CALL for Partnership from TÜBİTAK UZAY, Space Technologies Research Institute, TURKEY on the FP7 Programme, SPACE Theme

We are looking for partnership and cooperation in **Space Critical Technologies** under the 4th Space Call of FP7. We propose to be a work package leader or partner on the following critical technological areas in research projects.



Specific Sectors of Interests:

- Very high speed serial interfaces

Research Topic According to the Work Programme 2011:

Activity: 9.2. Strengthening the foundations of Space science and technology

SPA.2011.2.2-02 Space critical technologies

Space Work Programme declares developing priority technologies. TÜBİTAK UZAY has expertise to supply the requirements defined in EC-ESA-EDA Joint Task Force (JTF) Final Report.

Suggestions for Cooperation and Specific Expertise of TUBİTAK UZAY on suggested areas:

TÜBİTAK coordinates space R&D activities in Turkey. TÜBİTAK UZAY is one of TÜBİTAK's research and development units, which has initiated satellite technologies in Turkey.

- We want to work in cooperation with a project team for designing and development of Very high speed serial interfaces

EC-ESA-EDA Joint Task Force Final Report defines requirements for very high speed serial interfaces: *"...Development of very high speed (1-10 Gbit/sec) links and networks for components/units interconnections. I/O devices for DSP computer applications: SpaceFiber (CODEC IP, Network terminal, Network bridge and Router ASICs)".*

TÜBİTAK UZAY's Real Time Application Software Development Group has expertise on development of safety critical, hard real time, embedded applications, Linux, INTEGRITY and RTEMS. We apply model driven approach: Rational Rhapsody in our Board Support Package development for PowerPC and SPARC based platforms. We have high-quality experience and expertise on firmware development.

We have capability of applying the standards of ESA, PUS (Packet Utilization Service), ECSS Software Engineering, CCSDS, SOIS (Spacecraft Onboard Interface Services) and CFDP (CCSDS File Delivery Protocol) in our products. We have designed and implemented a new generation mission computer and solid state data recorder.

TÜBİTAK UZAY has a design of next generation scalable and modular blade system fully planned for space utilization. In our system, there are two different types of boards: one having a high performance SOI dual-core PowerPC processor and a LEON3FT as system manager on an anti-fuse FPGA. In the second board, a high-end SRAM based Xilinx Virtex5 FPGA is used with an external scrubber and configuration manager and 2 x 512Gbit mass storage on board. Any number of these two different boards can be connected in parallel, thanks to a SpaceWire and a 2 x 3.25Gbps RapidIO switched networks (the second board has a 10-port RapidIO switch and a 6-port SpaceWire router). The RapidIO links can also easily be replaced by PCI-express links.

Each Virtex5 FPGA boards contain another gigabit serial communication channel allowing Xilinx Aurora protocol to run between each FPGA board. In the design, COTS SERDES devices, FPGA IP and COTS RapidIO switches are used. We plan to test TID of the COTS components for LEO mission and all design is protected against SEU by anti-fuse FPGAs and dual-core CPUs. We plan to develop radiation hardened libraries for missions requiring higher levels of radiation of multi-gigabit interfaces. We also plan to design router and switch ASICs for those high-speed serial interfaces over copper and optical fiber.

- **TÜBİTAK UZAY can successfully collaborate with other European researchers on design activities in Critical Technologies. TÜBİTAK UZAY has qualified critical technology expertise to deliver for European non-dependence process.**

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