

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:

- Low-cost high-resolution L and X-band SAR components
- Development of Large Deployable structures

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 TÜBİTAK UZAY on suggested areas:

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

- We want to work in cooperation with a project team for development of **Low-cost high-resolution L and X-band SAR components**

EC-ESA-EDA Joint Task Force Final Report defines **requirements**: “...Advanced (generic) TR Modules (20 W GaN), standardized architecture - Flexibility Generic power supply units (converter) Low loss arrays technologies Advanced core radar processing electronics High demanding Solid state mass memory (Flash and DDR) > few Tbits from 1 to few Gbit/s High Speed High Efficiency ACM Modems Advanced antennas Broadband, high power, passive RF components Broadband, high power TWTs...”

We have highly qualified telecommunication division, experienced in transmitter design for space applications. We have developed an X-band reconfigurable transmitter suitable for LEO satellites with highly efficient solid state power amplifier and CCSDS packet telemetry standard, CCSDS channel coding standard and RRC filter are implemented on FPGA, Xilinx Virtex II. The solid state power amplifier is developed using Eudyna's FLM series Gallium Arsenide transistors, we have important experience in transistor level power amplifier design.

We are working in passive microwave circuit design. We have developed 2-18GHz 3dB hybrid coupler, 2-18GHz power divider, narrow band and wide band band-pass filters for various applications and band pass filter and narrow-band 6 dB directional coupler for space applications. We studied on low weight antenna design for space craft and UAVs.

We are also working on low phase noise Voltage Controlled Oscillator (VCO) design and Low Noise Amplifier (LNA) Design using standard CMOS process.

Researchers of TUBITAK UZAY have various international peer reviewed publications on these research areas.

We want to work in cooperation with a project team for designing TR modules, broadband passive RF components, low weight antennas and RF ICs especially including LNA and VCO.

- **We want to work in cooperation with a project team for development of Large Deployable structures**

EC-ESA-EDA Joint Task Force Final Report defines requirements for Large Deployable Structures : *“...Large deployable structures are needed as backbone and integral part of large reflectors, Earth observation antennas, radiators, sun shields and solar arrays. In addition to providing a deployment function, the structure shall provide shape, stability and integrity for the subsystem in question throughout its mission...”*

TÜBİTAK UZAY has a highly-qualified Mechanical Design Department and having hands-on experience in the design, analysis, manufacturing, integration and testing of space structures. Our primary focus was on innovative small satellites and subsystems. As increasing capabilities of small satellites, their size becomes a limiting factor where bigger antennas or large solar panels are required. We recognized the potential of the cost-effectiveness of self-deployable and inflatable structures in compact satellite design. TUBITAK UZAY is currently researching on such systems and how best to exploit the potential of such deployable and inflatable systems with a focus on composite materials.

- **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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