

The “Radiation Tolerant DDL” project

made in the framework of the Hungarian National Development Plan, supported by the European Community and the Hungarian State. Contact number: GVOP-3.1.1-AKF-0423

The main goals of the project as formulated in July 2005:

to develop electronic devices (mainly high speed data transfer devices) for scientific and space experiments. The devices will be able to tolerate radiation or eliminate the injurious effects. The developed solutions and devices are planned to be used in high energy physical experiments, first of all at the new LHC accelerator in CERN, and also at the design of Future Facility at the GSI (Research Institute for Heavy Ion) in Darmstadt; at the RHIC – STAR experiment in Brookhaven (USA) and in space research (in developments of Space Physics Department of KFKI-RMKI).

The realization of radiation tolerance and self-correction take place in the following steps. We select and investigate those programmable logical devices (PLDs, FPGAs) found in the market, which are the most resistant against the cumulative and destructive radiation effects. The resistance will be tested by adequate radiation tests that will be carried out on the cyclotron of Nuclear Research Institute (ATOMKI) in Debrecen. Then for these devices we will develop such logical functions and electronic solutions that are able to detect and correct their own failures. We will investigate several solutions: redundant circuits, automatic configuration monitoring and correction, etc. The developed methods will be tested in radiation environment and integrated to data transmission devices.