

Space-oriented Master Studies at the KHBO-Aerospace Department



The Aerospace Department of the KHBO-Faculty of Industrial Sciences and Technology is located at the Ostend Campus, close to the international airport Ostend-Bruges. Its goal is to offer a wide range of aerospace related professional and academic education programmes, matched to the needs of the national and European aerospace industry. The department offers also to students and staff members the opportunities of a wide European-aerospace-exchange-network (mainly Socrates), including universities in Spain, France, United Kingdom, the Netherlands, Finland, Germany, Poland, Czech Republic, Slovak Republic and Italy. On the other hand, every year we offer to some ten aero-engineering students from abroad, an adapted one semester (30-credits) programme.

The professional bachelor in aviation programme (180 ECTS-credits) provides a common scientific and aviation technology oriented core, plus a choice between two degree-options: aviation technology or aspirant air transport pilot. Both options are adapted to the European Civil Aviation Requirements.

The academic bachelor and master programmes in industrial sciences, adapted to the new Bologna-structure, offer possibilities to choose between specific avionics/spacionics related or aircraft/spacecraft systems related course packages, including industrial training and final project work.

On top, the KHBO-Faculty of Industrial Sciences offers a part-time modular post-graduate master of science in avionics degree (60 ECTS-credits). This 'Avionics and Spacionics Design Engineer' programme, at MSc-level, is rather unique in Europe. It is intended for high potential aviation- and space electronics design engineers. It includes five modules: aerospace technology and advanced computing, avionics and spacionics technology, avionics and spacionic systems design requirements and project management, intermodal transport economics and an advanced master thesis. Some of these courses are offered in a short course format, open to engineers and project managers from abroad. These modules are also part of the Europads-B-project (A European Professional Aerospace Development Scheme), intending to create a multinational Master in Aerospace Engineering or Aerospace Management.

In November 2003, KHBO organised a specialised one week Europads-B-module on 'Spacionic Systems Design', in strong cooperation with VRI-Flemish Space Companies members. The module focused on space systems project management, the design and development of small satellites and applications in the field of satellite navigation and communication, ground segment equipment and earth observation.

KHBO is also involved with IMEC in an ESA-PCDF-project. The ESA Protein Crystallisation Diagnostics Facility (PCDF) is a multi-user instrument for the fundamental study of the processes of nucleation and crystallisation of biological macromolecules, and specifically, how these processes are influenced by gravity.

PCDF consists of a 'processing unit' for the scientific experiments and an 'electronics unit' for drive and control such as a CCD-camera, drivers for laser, positioning motors and interfaces.

Data of the experiments and digital video images, such as microscope images and interferograms, are stored on board of the ISS-station and/or transmitted to an earth control station. A major part of the electronics for PCDF has been designed and tested at the IMEC/KHBO laboratory under the supervision of EADS, Friedrichshafen.

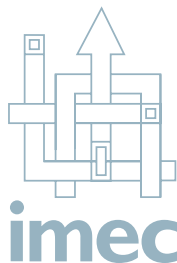
More information about the KHBO-Aerospace Department activities and the part-time MSc-course are available on the khbo-website (www.khbo.be) or contact the coordinator by e-mail: roland.defever@khbo.be



IN THIS EDITION

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IMEC's radiation hardened DARE standard cell library



Due to the reduced demand by military customers and the lack of commercially interesting production volumes all European radiation hard chip foundries but one have left the market.

IMEC now introduces a radiation hardened standard cell library. The library was called DARE, an acronym for Design Against Radiation Effects. Using layout and design techniques the impact of radiation has been diminished resulting in a cell

library for the commercially available 180 nm UMC CMOS 6-layer metal technology.

The library holds 86 logical cells (2x18 memory cells (flip-flops and latches, each available in a SEU (Single Event Upset) hardened version and a non-SEU hardened version) and 50 combinatorial cells) and 29 functional I/O cells (among which an LVDS (Low-Voltage Differential Signaling) driver and receiver and several pull-up and pull-down options) with 4kV HBM (Human Body Model) ESD (ElectroStatic Discharge) protection. The library is enhanced with a single port SRAM compiler and a PLL (Phase Locked Loop) to be used in the I/O ring.

The UMC 180 nm technology is available through the Europractice IC service that allows fabricating prototypes and small-volume chips at reduced cost. IMEC's layout service provides the path from a –e.g. from VHDL- synthesized net-list to GDSII – the format sent to UMC for fabrication.

The first design using the new library (see picture) was designed in co-operation with Alcatel Space, Toulouse. The chip is fully functional within its specifications and the radiation tests show a very good total dose and single event effects behavior. Meanwhile tests for a second chip are under way. On this chip structures were implemented to test individual library cells. The chip also allows investigating the relative importance of the different techniques used to harden the library.



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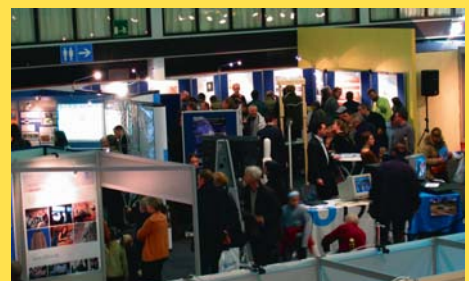
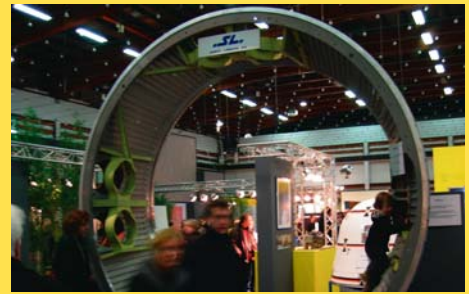


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