



INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Tento projekt je spolufinancován Evropským sociálním fondem a státním rozpočtem České republiky.

Pozvánka na veřejnou přednášku

Ústav fyziky Fakulty elektrotechniky a komunikačních technologií VUT v Brně si Vás v rámci projektu Operačního programu Vzdělávání pro konkurenceschopnost dovoluje pozvat na přednášku

Robust Microsystems for Automotive and Airborne Applications

Přednášející

Prof. Ulrich Schmid

Datum

29.11. 2010 – 10:00 – 12:00

Místo

Ústav fyziky
Fakulta elektrotechniky a komunikačních technologií
VUT v Brně, Technická 8, 616 00, Brno
přednášková místnost **T-215**

Abstrakt

One topic will comprise the development and system integration of a novel type of hot film anemometer targeted for the detection of important injection parameters in Common Rail systems, such as injection begin/end and injected fuel quantity. The robust sensor element is completely integrated into an injection nozzle and based on LTCC (low temperature co-fired ceramics) and thin film technology, as the device needs to withstand hydraulic pressures up to 1350 bar. The sensor signals are evaluated in respect to standard measurement equipment and to hydraulic simulations performed on system level.

The LTCC technology is in addition of high interest for the realization of a compact radar module operated at 79 GHz for mid range (< ~80 m) surveillance purposes in automotive and for the detection of vortexes in airborne application scenarios, respectively. Besides the micro- and nanopatterning of the LTCC substrate enabling the local modification of dielectric properties results on the hardware realization and on the device performance of a high-temperature stable RF-MEMS switch are presented which withstands fabrication temperatures up to 450°C.

Furthermore, novel approaches for the fabrication of high temperature stable pressure sensors are discussed designed for temperatures up to 700°C in e.g. gas turbines and rocket



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engines. As substrate materials sapphire, a nickel-based superalloy or modified LTCC tapes are used. In this context, the high temperature stability of dielectric (i.e. sputter-deposited Al_2O_3) and metallic (i.e. Ti/Pt) thin films is investigated.

Finally, the actual activities in the field of resonant microstructures are addressed. Sputter deposited aluminium nitride (AlN) as piezoelectric thin film is used to excite micromachined test structures, such as cantilevers and two-sided clamped bridges, to study in depth the modal behaviour, especially when targeting an improved performance via a tailored patterning of the top electrode.

Kontakt

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