

Training of Prof. Castellazzi



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Deployment of novel converter architectures and power switch technologies for high performance motor drives

As worldwide energy demand keeps increasing, so does the electrification level of the main infrastructural pillars of our society (e.g., energy supply, transportation, manufacturing).

A very large and growing proportion of electrical energy is used in the operation of motor drives, driven by solid-state power converters. Wide-band-gap (WBG) semiconductor technologies (primarily, silicon carbide - SiC - and gallium nitride - GaN -) are constantly consolidating their status over silicon as breakthrough enablers in efficiency, power density and reliability.

Their true disruptive potential, however, has not yet been fully unleashed in large-volume applications, where mainly incremental progress only was demonstrated.

This seminar reviews learning done hitherto and discusses joint topology-technology design approaches enabling full exploitation of the superior features of WBG power devices.

Prof. Castellazzi

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Dr. Alberto Castellazzi is a professor at KUAS Faculty of Engineering. He leads research and teaching in advanced solid-state power processing, including the characterization and use of wide-band-gap (WBG) semiconductor devices (silicon carbide, SiC; gallium nitride, GaN), their packaging and thermal management, to yield disruptive joint progress in efficiency, power density and reliability of power converters.

Dr. Castellazzi earned a Laurea degree in Physics from the University of Milan, Italy in 1998, and a PhD in Electrical Engineering from the Munich University of Technology (TU Munich), Germany in 2004. He has been involved in power electronics research and development for over 20 years, with affiliation and working experience in both industry and academia, including SIEMENS Corporate Technology (Germany), ETH Zurich (Switzerland), ALSTOM Transport (France) and the University of Nottingham (UK).

Dr. Castellazzi has published over 200 papers in specialist international journals and conference proceedings and has held a number of invited talks, tutorials and seminars on the topic of WBG power devices and SiC-based electrical power conversion. He is active as both a reviewer and editor and is a member of the technical program committee of a number of international conferences on power electronics and power semiconductor devices.

Dr. Castellazzi is a member of the Power Electronic Conversion Technology Annex (PECTA) of the International Energy Agency (IEA) (more info at: <https://pecta.iea-4e.org/>).