



IAL laboratory

The Institute's Profile

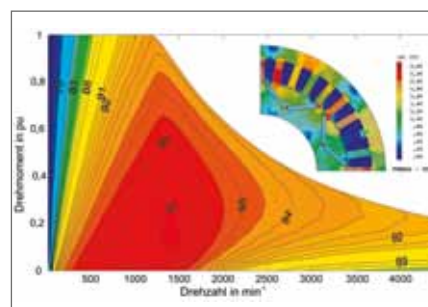
At the Institute for Drive Systems and Power Electronics, experts for electrical machines, power electronics and drive control are working on research projects covering the entire field of drive technology, reaching from the microwatt to the multi-megawatt range. A unique feature of the IAL in the German-speaking part of the world is the close co-operation of two full professorships in drive technology united in one institute, each of the professors having approximately 10 years of practical experience in industry. The joining of the two formerly independent institutes Electrical Machines and Drives and Power Electronics to one institute in 2001 reflects the technological development towards integral overall systems. On the one hand, this structure is the ideal basis for a close co-operation, and on the other hand, it offers distinct expertise in both chairs.

The IAL presently consists of 2 full professors, 3 retired professors, 2 senior researchers (post docs), more than 40 research associates, 11 administrative and technical staff members and approximately 50 students.

Chair of Electrical Machines and Drive Systems

The main research work in the field of electrical machines focuses on the development of calculation methods and software as well as on the research, pre-calculation and elimination of technically important parasitic effects like magnetically excited noise, torque pulsations or bearing currents.

The chair is actually held by Prof. Dr.-Ing. Bernd Ponick, whose fields of activity especially comprise harmonic field effects in induction and synchronous machines, small electrical machines and micro actuators, combined analytical and numerical



Efficiency map of a PMSM with buried magnets in V shape



Converter for electrified scooter Piaggio MP3

calculation methods, transient phenomena in drive systems, special effects concerning converterfed machines and fault analysis in electrical drive systems.

Chair of Power Electronics and Drive Control

The competences in the field of power electronics are reaching from the characterisation of power semiconductors and the development of innovative gate drives, the design and optimisation of power electronic circuits including filters, to converter control and modulation methods, and the control of electric drives with or without mechanical sensors.

The chair is held by Prof. Dr.-Ing. Axel Mertens, whose fields of activity comprise applications of power electronics and drives in hybrid and electric vehicles, in wind energy and distributed power generation, and in industrial applications.