

SUPER – Stuttgart University Program for Experiencing Research Project Information

Institute's Information

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Duration of Project/Number of Students

June/July

June/July/August >= 2.5 months

Number of Students 1-2

Name of Project Performance analysis of fully integrated transmit and receive RF frontends

used in ultra-high data rate wireless communication links

Beneficial Skills

& Knowledge • Background in electrical engineering, telecommunication systems

Basic knowledge in radio frequency (RF) electronics, metrology

• First Contact Points with Microcontroller / FPGA Programming

Description of Work

The ILH conducts research in high data rate microwave communication systems based on wide-bandgap semiconductor technologies. The ILH is recommended by the International Telecommunication Union (ITU) standard ITU-R F.2323-0 for successfully transmitting Digital Video Broadcasting — Cable (DVB-C) at 220 GHz reaching 15 Gbit/s with error-free transmission in 2011 and holds the record of data transmission at 71-76 GHz. The team is involved in the demonstration of the feasibility of the RF link in E-Band between a satellite and a ground-station and it is planning multiple terrestrial transmission experiments in E-Band as well as H-Band. The goal is to develop technical solutions for communication networks in the context of beyond-5G technologies also complying with the newly established IEEE 802.15.3d standard for switched point-to-point links range between 252 GHz and 325 GHz. The focus of the thesis is to perform long range measurements, demonstrations and performance analysis of RF links for THz and/or satellite communication systems. The specific project description and definition of objectives will be defined together with the student, depending on the student's preferences and competences.

