

The research institute Acreo – Swedish ICT invites for a two year Post Doc position in an optics/photonics research project entitled: “Lab and simulation evaluation of phase noise influence in long range coherent transmission systems”.

Background

Multi level coherent optical communication systems are under research with the aim of allowing 10-100 Tb/s transmission capacity over thousands of kilometers of fiber distances. These high constellation systems are mostly coherent systems with semiconductor lasers as transmitter and local oscillator and may use Raman type optical amplification. The use of wavelength division multiplexed coherent systems is a viable way of increasing the capacity over one transmission fiber to the 100 Tb/s level. As such the systems are subject to influence of (laser) phase noise, intensity noise, additive noise, fiber dispersion and non-linearities, channel cross talk and various imperfections in the practical system realization. It is imperative to choose system designs that minimize the noise influence and the impact of non-linearities and imperfections especially concerning phase noise and equalization enhanced phase noise for long range system which will be the main subject of investigation in the Post Doc work. Here, the digital signal processing (DSP) configuration in the system transmitter and receiver is important.

Project

The project will develop and investigate theoretically, by simulations and experimentally new methods for constructing communications systems for long range transmission (>1000 km transmission range) with very high capacity. The work will be performed within the EU Marie Curie project ICONE which starts February 1, 2014 and has a duration of 4 years. The work will be in close collaboration with one PhD student at Acreo - Swedish ICT and 2 PhD students from Royal Institute of Technology (KTH) in Stockholm. Topics for study includes:

- Ways of incorporating features like chromatic dispersion, fiber non-linearities, Raman amplification, and decide which implementations give the best phase noise tolerance.
- Mitigation of component imperfections in system context.
- Modulation techniques that are interesting are coherent n-level Phase Shift Keying (PSK) and Quadrature Amplitude Modulated (QAM) systems as well OFDM systems.

The Post Doc research will be based on numerical simulations (i.e. using tools like MATLAB, VPITransmission Maker etc.) as well as on experimental verifications in the lab at high transmission speeds in the order of 100 GS/s.

Working at Acreo

Working place will be Acreo AB in Kista near Stockholm, the area prominent for academic and industrial research in the IT technology. Acreo has employees with high academic competence and our daily work is performed in an open and collaborative format. To enjoy and succeed in our company, you need to think innovatively and have a drive, be a team player, have focus on customer needs and results, and like to work in an international environment.

Qualifications

Applicants must hold a PhD degree or have an MSc degree plus 4 years of research

experience on PhD level. The applicant's background should be in optics/photonics, applied physics, electrical engineering, or related areas. Furthermore, the successful applicant has:

- Strong academic credentials, written and spoken English proficiency, communication and team-work skills, self-motivation and sense of initiative.
- Interest in following subjects: electro-optics, optical transmission systems. Strong motivation to perform simulation and experimentally based research.
- Ability to program in various languages (C++, MATLAB ...) and be able to verify and design advanced computer (simulation) software model implementations.

The applicant must document that he/she has not worked or resided more than 12 months in Sweden during the last three years (up until the time of employment).

Application

An application (in English) should include:

- *Cover letter*, one-page summary of your application
- *CV* including relevant documents demonstrating achievements and experience and two personal references
- *An official copy* of the MSc/PhD degree certificate and academic transcript
- *Certification of research work during the last four years* (in case of applicant not holding a PhD)

Optional: Copy of MSc/PhD thesis report (in PDF format), *List of publications* (if applicable) and *Reference letter(s)*.

Please send your application below as soon as possible and no later than **May 2, 2014**.

We will meet with applicants as applications are submitted.

For additional information, please contact

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