Master Thesis:

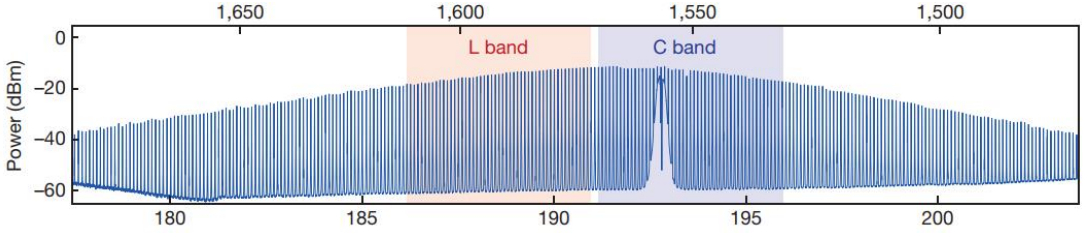
Photonic-aided analog-to-digital converter (ADC) enabled by synchronized soliton-Kerr frequency combs

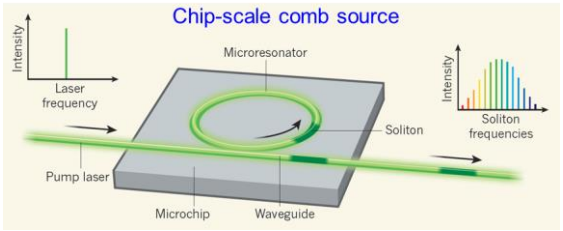
Karlsruhe Institute of Technology

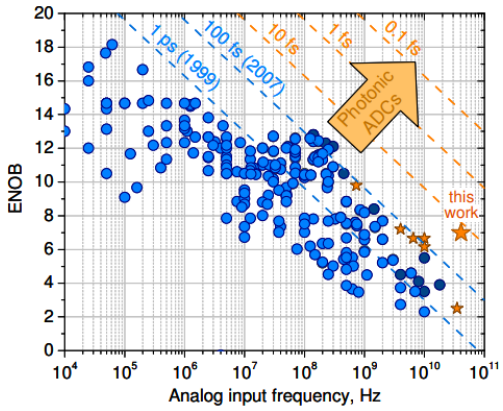
Optical frequency combs (OFC), derived from chip-scale sources, have very recently revolutionized fields of metrology, spectroscopy and optical communications [1-3], and are potential candidates to be used in photonic-aided ADC [4]. Photonic-aided ADC aims at the acquisition of broadband signals with a high effective number of bits (ENOB) when compared to conventional ADC [5].
This thesis mainly aims at experimentally demonstrating a photonic-assisted ADC measurement system based on synchronized frequency comb sources and to determine the impact of linewidth and OSNR.
You will be tightly supervised by one or more PhD candidates. This will allow you to learn and advance quickly in the Thesis, potentially leading to co-authoring a conference or journal publication.

Your tasks:

- Design and building experimental setup (Lab-work)
- Implement DSP to reconstruct the encoded signal (Matlab)
- Investigate effect of linewidth and optical signal-to-noise ratio (OSNR)







For detailed information contact:

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[1] Trocha, Philipp, et al. *Science* 359.6378 (2018)
[2] Suh, Myoung-Gyun, et al. *Science* 354.6312 (2016)
[3] Marin-Palomo, Pablo, et al. *Nature* 546.7657 (2017)
[4] Fontaine, Nicolas K., et al. *Nature Photonics* 4.4 (2010)
[5] Valley, George C., *Optics express* 15.5 (2007)

* A detailed work plan will be given at the beginning of the Thesis. Depending on your skills & interest, focus can be set more into a particular task. Duration: 6 Months. Starting: ASAP