International Conference on Advanced Optical Technologies
University of Erlangen-Nürnberg, March 13th – 15th 2019

Communicate to the Limit – A Journey Towards Reliable Optical Communications and Beyond

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In this talk, we review the history of channel coding, which is an essential tool to realize communication systems that operate at arbitrarily low error rates close to the theoretical limits postulated by Claude Shannon 70 years ago. We show how channel coding is applied in optical communications that form the network fabric of the core network. We review the recent advancement that led to the commercial introduction of extremely powerful and flexible transceivers that operate close to Shannon's limit over a wide range of conditions. In the second part of the talk, we show that even the improvements made in the past decades to close the gap to the Shannon limit are not yet sufficient to cope with the growing traffic demands in today's fiber-optic communication systems. We highlight paths to overcome this unavoidable opening gap and possible future research directions.

References

[1] U. Welcome, *Journal Fasc. Worksh.* **6**, 10-13 (2018)