

[Plenary Talk II] Evolution of Optical Communication Systems ~ Innovative Technologies and Future Prospective ~

Date & Time	July 3 (Tue.) / 10:00-10:45 (45')	Place	Halla Hall, 3F
Speaker	Masatoshi Suzuki (KDDI Research, Inc.)		

Biography

Dr. Masatoshi Suzuki received his Ph. D. from Hokkaido University. He joined KDD Research Laboratories (currently KDDI Research), Tokyo, Japan in 1984. Since then, he has been engaged in research on high-speed optical modulator/laser integrated devices, optical soliton transmission systems, WDM transmission systems and optical networks. Among them, invention of dispersion managed soliton transmission scheme is well-known as one of the most cited works in the optical communication research area. He was involved in the project on development of 10Gbit/s WDM ultra-long distance transmission systems, which were applied to trans-Pacific and trans-Atlantic undersea cable systems, such as Japan-US and TAT-14 as well as Asian undersea cable systems. He was the Executive Vice President of KDDI R&D Laboratories, Inc. from 2011 to 2016, and the R&D Fellow of KDDI Corporation from 2007 to 2017. Currently, he is the Principal Research Engineer of KDDI Research, Inc.. His current research interest is wireless and optical integrated technology for future mobile networks beyond 5G and ultra-large capacity optical communication systems based on space division multiplexing towards Peta bit/s era. Dr. Suzuki is a Fellow of IEEE, OSA, and IEICE in Japan and a member of the Engineering Academy of Japan. He received the Best Paper Award in 1996, Achievement award in 2004, Distinguished Achievement and Contributions Award in 2018, all from IEICE. He is also a recipient of Kenjiro Sakurai Memorial Prize from OITDA in 2009, Hisoka Maejima Award from Tsushinbunka Association in 2011, the Ichimura Prize in Industry for Distinguished Achievement from the New Technology Development Foundation in 2018, Minister Award on Science and Technology from MEXT (Ministry of Education, Culture, Sports, Science and Technology of Japan) in 2006, Minister Award of Advanced Technology from METI (Ministry of Economy, Trade and Industry of Japan) in 2006 and Medal with purple ribbon from Japan in 2017.

Abstract

Optical communication systems have been continuously evolved, and one million-fold increase in capacity has been achieved in last three decades. After inventions of glass fibers and semiconductor lasers, EDFA has emerged as a disruptive technology, eliminating regenerative repeaters and enabling WDM transmission. Potential of EDFA has been maximally derived by the dispersion management in the transmission line, especially in long-haul transmission systems. These technologies have realized more than 1000-fold increase in capacity for commercial trans-Pacific submarine cables within one decade. Recently digital coherent transmission scheme has been introduced as the latest innovative technology, and the fiber capacity has reached to 10 Tbit/s. There is a general consensus that the traffic growth rate will be accelerated with the rapid increase of mobile traffic in the 5G-era and beyond, where everything will be connected to the network through wireless and optical links. To accommodate such massive growth and deliver high-quality rich contents to the users, optical communication systems for mobile front/back-haul and core networks will become more indispensable. In this presentation, we will discuss the innovative technologies that enabled significant capacity growth of optical communication systems and address future potential technologies leading to 1000-fold capacity increase, 10Pbit/s per fiber, such as optical space-division-multiplexing.