

R&D for 5G mobile communication system

Capacity enhancing technologies based on ultra-high density, multi-band, multi-access, and multilayer cell architecture

In order to cope with an explosive growth of mobile communication traffic volume and to prepare for new services in future, the research and development of a fifth-generation mobile communication system with novel radio access technologies has been widely promoted. Tohoku University has been investigating two technical issues for ultra-high-density cell configuration; distributed antenna cooperative signal transmission technology and ultra-broadband mobile front hall transmission technology in the contract research of the Ministry of Internal Affairs and Communications towards the fifth-generation mobile communication system.

○ Distributed antenna cooperative signal transmission technology (Fig. 1): The objective is to achieve a significantly enhanced system capacity and a more than 3dB suppression of transmit signal peak power, by simultaneously using multiple antennas appropriately selected from a number of distributed antennas that are connected via optical links to baseband unit (BBU).

○ Ultra-broadband mobile front hall transmission technology (Fig. 2): The objective is to achieve 100 Gbit/s digital coherent transmission in the radio access network consisting of optical fiber access, in order to realize efficient accommodation of distributed antennas, broadband access, and extension of optical link distance.

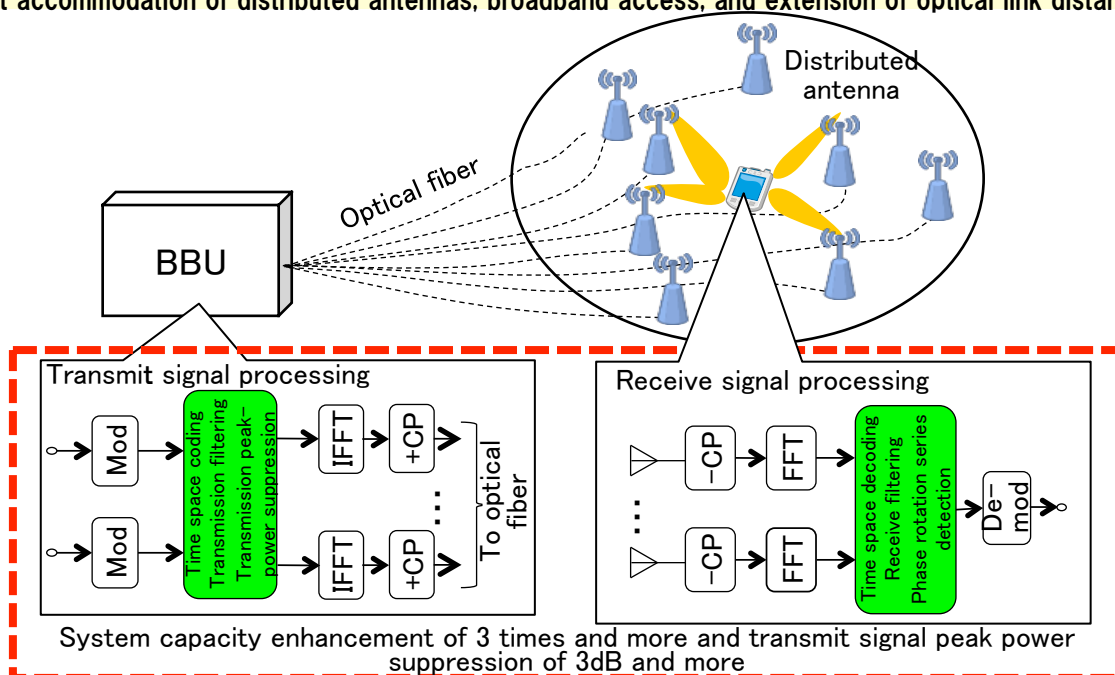


Fig.1 Distributed antenna cooperative signal transmission technology

100 Gbit/s digital coherent transmission
suitable for mobile front hau

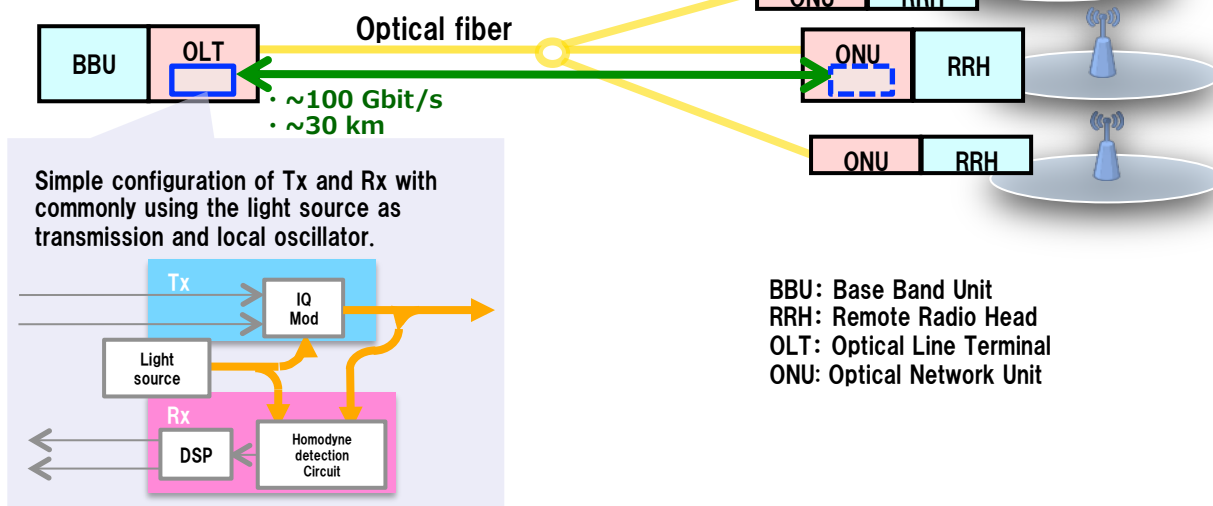


Fig. 2 Ultra-broadband mobile front hall transmission technology