Analysis of the Energy Efficiency in the Future NG-PON Networks Utilizing the WDM Technology

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Abstract. New optical fifth-generation fixed communication networks with various dimensions and different network parts are expected in the near future. Besides extra high transmission rates and ubiquitous reliable optical connections, their network efficiency will be an important role. In this contribution, an attention is focused on future access next-generation passive optical networks (NG-PON) that present the most dynamic developing part of advanced fixed optical networks. For their development, a transition to the wavelength division multiplexing (WDM) technique is the important factor for effective utilization of available wavelengths not only from a viewpoint of the transmission capacity, but also from the energy efficiency. Except dynamic bandwidth allocation algorithms applied in current passive optical networks, research directions for advanced dynamic wavelength allocation algorithms considered for future passive optical networks are introduced in more details. Concurrently, the dense 15-channel wavelength transmission system designated for testing and verification of proposed dynamic wavelength allocation algorithms primarily oriented on the energy efficiency is presented.

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