

# Reservoir Computing Based Equalization for Radio over Fiber System

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**Abstract**— Reservoir computing (RC) attracts much attention in many timeseries tasks due to its nonlinear mapping capability from the lower space to the higher space and the dynamic memory ability. With conceptual simplicity and computation cheapness, RC is also suitable for hardware implementation. In this paper, the RC is applied to perform the signal equalization for wavelength division multiplexing (WDM) radio over fiber (RoF) system to compensate the distortion caused by the nonlinearity of single wavelength and the interference between multiple wavelengths. Simulation results show that RC with 500 reservoir nodes can enhance the adjacent channel power ratio (ACPR) of the WDMRoF system from 6 dB to 9 dB after equalization, where the ACPR can be further improved by simply increasing the reservoir size.

**Keyword**— Reservoir Computing, Equalization, Wavelength Division Multiplexing, RoF, Distortion, Adjacent Channel Power Ratio.



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