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(54) **OPTICAL NETWORK SYSTEM, CONTROL METHOD, AND CONTROL DEVICE**

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(57) **ABSTRACT**

An optical network system includes an optical repeater and a control device controlling the optical repeater. The control device: manages wavelength information of optical signals transmitted and received by the optical repeater in a path of the optical network and transmission line information of optical transmission lines connected to the optical repeater; determines a chromatic dispersion compensation amount for compensation in the optical repeater based on the wavelength information and the transmission line information; and determines phase conjugation processing in the optical repeater based on the wavelength information and the transmission line information. The optical repeater: acquires the chromatic dispersion compensation amount and phase conjugation processing information from the control device; performs chromatic dispersion compensation processing on an electrical signal based on the chromatic dispersion compensation amount; and performs phase conjugation processing on an electrical signal based on the phase conjugation processing information.