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Optical frequency shifter and transmission system

Abstract

An optical transmission system has an input light guide and N multipath modulators operated as frequency shifters connected in cascade to receive light from the input light guide and output light along N output light guides where N is 1 or more, wherein the light carried by each ith output light guide, where i=1, . . . , N, is shifted in frequency from light carried by the input light guide by i.omega..sub.m, and where each set of multipath modulators contributes a frequency translation of .omega..sub.m and where the light from each output light guide is modulated and combined with all other modulated output light to form a multiwavelength transmission system. A receiver equipped with similar frequency shifters is configured to generate a number of optical reference signals of frequencies .omega..sub.0 +i.omega..sub.m, each reference sign to be added as a separate portion of the received signal so as to perform self-homodyne detection of the information signal associated with each respective modulated frequency.

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