

Distance measurement by the maximum frequency of interference signal variation with harmonic deviation of the wavelength of a semiconductor laser

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A method for measuring absolute distances from the low-frequency spectrum of the interference signal of a frequency-modulated laser diode is proposed. The method of frequency modulation of the laser autodyne signal according to the harmonic law is used, in the spectrum of which a wide range of frequency components is observed. The relation of the maximum instantaneous rate of change in the wavelength of laser radiation with the absolute distance to the reflector is shown. The linear dependence of the frequency of the spectral harmonic corresponding to the maximum frequency of change of the interference signal on the distance is established, the value of which can be used to implement a non-contact method of measuring distance with harmonic modulation of the laser diode supply current.

Keywords: laser interferometry, autodyne, semiconductor laser, laser radiation modulation, distance measurement, signal spectral analysis.