A New Laser-based Sensing System for Monitoring and Control of Webs

Article

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Abstract

A new laser based sensing system for measuring the velocity of the web is proposed in this paper. The doppler shift between the incident light and scattered light from a moving particle contains information about the velocity of the particle. A collimated laser source is incident on the web edge and scattered light is collected. The proposed sensing system measures the true velocity of the web by measuring the doppler shift. The doppler shift is measured by heterodyning the scattered light and incident light. The sensor is capable of measuring the web velocity in all three directions, longitudinal, lateral, and transverse. The measurement of the three true velocity components will be highly beneficial for both monitoring and control of webs. The theory of operation of the sensing system is developed based on the reference beam technique. The methods that will be used for processing various signals are given. The architecture of the sensor is described and construction of the sensing system is underway. The experimental platform developed thus far is discussed in detail.

Link to the Article