

Measurement of linear thermal expansion by using fiber optic displacement sensor method

Thursday, May 21, 2015 9:00 AM (15 minutes)

Fiber optic displacement sensor (FODS) is demonstrated to probe the linear thermal expansion of materials. The device employs an intensity modulation technique which is based on comparing the transmitted light intensity against that of the launch light to provide information on the displacement between the probe and the target. Steel and Aluminum were used as the target. From the thermal expansion phenomena, material will expand when heated. As the displacement between the probe and the material was changed due to the thermal expansion, the intensity signal from reflected light was collected. Although, the displacement between the probe and target was slightly, it could still be detect by the proposal device. The measured linear expansion results are checked against the expected theoretical and the operation of this sensor was also compared with other techniques. Advantages of the proposed technique include non-contact measurement, economical set up and suitability for many applications and precise measurements.

Primary author: Mr PHANPANICH, Paradai (Department of Physics, Faculty of science, Mahidol university, 272 Rama 6 Road Ratchathewi Bangkok, 10400)

Co-authors: Dr ARAYATHANITKUL, Kwan (Department of Physics, Faculty of science, Mahidol University, Bangkok 10400, Thailand); Dr CHITAREE, Ratchapak (Department of Physics, Faculty of science, Mahidol University, Bangkok 10400, Thailand)

Presenter: Mr PHANPANICH, Paradai (Department of Physics, Faculty of science, Mahidol university, 272 Rama 6 Road Ratchathewi Bangkok, 10400)

Session Classification: Optics, Non-linear Optics, Laser Physics, Ultrafast Phenomena

Track Classification: Optics, Non-linear optics, Laser Physics, Ultrafast Phenomena