Optical tomography system using charge-coupled device for transparent object detection

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ABSTRACT

This research presents an application of Charge-Coupled Device (CCD) linear sensor and laser diode in an optical tomography system. Optical tomography is a non-invasive and non-intrusive method of capturing a cross-sectional image of multiphase flow. The measurements are based on the final light intensity received by the sensor and this approach is limited to detect solid objects only. The aim of this research is to analyse and demonstrate the capability of laser with a CCD in an optical tomography system for detecting objects with different clarity in crystal clear water. Experiments for detecting transparent objects were conducted. The object's diameter and image reconstruction can also be observed. As a conclusion, this research has successfully developed a non-intrusive and non-invasive optical tomography system that can detect objects in crystal clear water.

KEYWORDS:

Optical tomography system; Charge-Coupled Device; laser diode; image reconstruction