



Journal Menu

- Abstracting and Indexing
- Aims and Scope
- Article Processing Charges
- Articles in Press
- Author Guidelines
- Bibliographic Information
- Contact Information
- Editorial Board
- Editorial Workflow
- Reviewers Acknowledgment
- Subscription Information

- Open Special Issues
- Published Special Issues
- Special Issue Guidelines

Call for Proposals for
Special Issues

International Journal of Biomedical Imaging
Volume 2007 (2007), Article ID 28387, 9 pages
doi:10.1155/2007/28387

Research Article

A Near-Infrared Optical Tomography System Based on Photomultiplier Tube

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Received 5 January 2007; Revised 7 May 2007; Accepted 7 June 2007

Academic Editor: Jie Tian

Abstract

Diffuse optical tomography (DOT) is a rapidly growing discipline in recent years. It plays an important role in many fields, such as detecting breast cancer and monitoring the cerebra oxygenation. In this paper, a relatively simple, inexpensive, and conveniently used DOT system is presented in detail, in which only one photomultiplier tube is employed as the detector and an optical multiplexer is used to alter the detector channels. The 32-channel imager is consisted of 16-launch fibers and 16-detector fibers bundles, which works in the near-infrared (NIR) spectral range under continuous-wave (CW) model. The entire imaging system can work highly automatically and harmoniously. Experiments based on the proposed imaging system were performed, and the desired results can be obtained. The experimental results suggested that the proposed imaging instrumentation is effective.

[Abstract](#)[Full-Text PDF](#)[Linked References](#)[How to Cite this Article](#)[Complete Special Issue](#)