

## 全光纤光学相干层析牙齿检测系统的解调

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摘要:

结合虚拟仪器技术和光学相干层析技术, 设计了用于口腔牙齿检测的全光纤光学相干层析系统。通过对干涉信号进行一系列的变换、分析, 获得离体牙齿的二维图像。使用LabVIEW实现信号的解调及控制, 包括步进电机的驱动、数据同步采集控制、数字滤波、提取信号包络以及二维图像的重建。通过实验可测量出离体的内部细微结构, 为早期的龋齿诊断提供依据。

关键词: 光学相干层析; 龋齿; 解调; LabVIEW

## The demodulation of all-fiber Optical Coherence Tomography dental diagnosis system

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**Abstract:**

Combining Optical Coherence Tomography (OCT) with the technology of Virtual Instruments, OCT system applied in oral tooth detection is designed. Two dimensional image of the vitro teeth through processing the interference signal is acquired. The system uses LabVIEW to implement signal demodulation and control including the drive of stepper motor, the synchronous data acquisition, digital filtering, signal envelope extraction and two-dimension reconstruction. With the experiment it can measure the inner micro structures in the vitro teeth, which can provide basis for early diagnosis of dental caries.

**Keywords:** Optical Coherence Tomography; dental caries; demodulation; LabVIEW

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