

光谱学与光谱分析

## Spectral Target-Detecting System Using Sine-Wave Modulation

DENG Wei<sup>1</sup>, ZHAO Chun-jiang<sup>1\*</sup>, ZHANG Lu-da<sup>2</sup>, CHENG Li-ping<sup>1</sup>, Andrew Landers<sup>3</sup>

1. National Engineering Research Center for Information Technology in Agriculture, Beijing 100097, China

2. College of Science, China Agricultural University, Beijing 100193, China

3. Cornell University, NY 14456, USA

收稿日期 2010-12-14 修回日期 2011-3-13 网络版发布日期 2011-10-1

**摘要** Target detection is one of the key technology of precision chemical application. Previously the digital coding modulation technique was commonly used to emit and receive the optical signal in the target detection systems previously in China. It was difficult to adjust the output power, and the anti-interference ability was weak in these systems. In order to resolve these problems, the target detection method based on analog sine-wave modulation was studied. The spectral detecting system was set up in the aspects of working principle, electric circuit, and optical path. Lab testing was performed. The results showed that the reflected signal from the target varied inversely with detection distances. It indicated that it was feasible to establish the target detection system using analog sine-wave modulation technology. Furthermore, quantitative measurement of the reflected optical signal for near-infrared and visible light could be achieved by using this system. The research laid the foundation for the future development of the corresponding instrument.

**关键词** [Sine-wave modulation](#) [Analog](#) [Target detection](#) [Optical spectrum](#)

**分类号** [TP391](#)

**DOI:** [10.3964/j.issn.1000-0593\(2011\)10-2771-07](#)

通讯作者:

[zhaocj@nercita.org.cn](mailto:zhaocj@nercita.org.cn)

### 扩展功能

#### 本文信息

▶ [Supporting info](#)

▶ [PDF\(2400KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献\[PDF\]](#)

▶ [参考文献](#)

#### 服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [引用本文](#)

▶ [Email Alert](#)

#### 相关信息

▶ [本刊中 包含“Sine-wave modulation”的 相关文章](#)

▶ 本文作者相关文章

· [DENG Wei](#)

· [ZHAO Chun-jiang](#)

· [ZHANG Lu-da](#)

· [CHENG Li-ping](#)

· [Andre Landers](#)