

天美（中国）科学仪器有限公司
TECHCOMP (CHINA) LTD.

中国北京朝阳区天畅园 7 号楼 1、3 层
TEL:010-64010651
FAX:010-64060202
E-MAIL:techcomp@techcomp.cn

Technical Note

商品化 TCSPC 技术光谱仪的
最新光源（摘要）



EDINBURGH
INSTRUMENTS

New light sources for time correlated single photon counting in commercially available spectrometers

Roger Fenske*, Dirk U. Näther, Mark Goossens, S. Desmond Smith

Edinburgh Instruments, 2 Bain Square, Kirkton Campus, Livingston, UK, EH54 7DQ;

ABSTRACT

The method of Time Correlated Single Photon Counting requires high repetitive light sources (>100kHz) with pulse widths of ideally less than approximately 20ps. While these light sources have been available for some time now in the form of Ti:Sapphire lasers, picosecond pulsed diode lasers (<90ps) and light emitting diodes (<700ps), they all have the drawback of either having no spectral tunability, or tunability over a very narrow spectral range (10nm-100nm).

While this is often sufficient for specific laboratory setups for measurements of fluorescence lifetimes, commercial Fluorescence Lifetime Spectrometers have suffered for a long time from the lack of the availability of simple, compact and relatively inexpensive broad spectral band light sources that can be employed for Time Correlated Single Photon Counting.

A new light source as an integral part of a commercial fluorescence lifetime spectrometer will be discussed that allows tunability over a wide spectral band of more than 500nm.

Keywords: Time Correlated Single Photon Counting, supercontinuum light source



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摘要

时间相关单光子计数技术的光源必须具有：高重复性(> 100kHz)、理想脉冲幅宽低于 20ps。现在已有的光源类型有钛蓝宝石激光光源、皮秒脉冲二极管激光光源(<90ps)和发光二极管(<700ps)等，这些光源均存在缺陷，不具备光谱可调谐性，或可调幅度很窄(10nm-100nm)。

尽管这些光源可以满足某些实验室的荧光寿命测量需求，商品化荧光寿命光谱仪还是苦于没有找到一种可与 TCSPC 联用的，简单、紧凑和相对便宜的宽光谱范围光源。本文介绍了一种全新的集成于商品化荧光寿命光谱仪的光源，这种光源在大于 500nm，很宽的光谱范围内均具备可调谐性。

关键词：时间相关单光子计数，TCSPC，超连续激光光源