Methods for Positronium Lifetime Image Reconstruction

Tech ID: 33809 / UC Case 2022-579-0

ABSTRACT

Researchers at the University of California, Davis have developed a technology involving statistically reconstructing positronium (or positron) lifetime imaging (PLI) for use with a positron emission tomography (PET) scanner, to produce images having resolutions better than can be obtained with existing time-of-flight (TOF) systems.

FULL DESCRIPTION

The technology leverages positron emission tomography (PET) scanners to provide reconstructed positronium lifetime imaging (PLI). It improves the scanning precision, allowing for noninvasive, clear imaging of tissue and enabling better medical treatment plans.

APPLICATIONS

- Improves resolution, providing more precise imaging than existing TOF systems
- Allows for noninvasive patient examination
- Enables accurate identification of hypoxic regions in a human body
- Compatible with existing PET scanners
- Overcomes the lack of practical methods for imaging positronium lifetimes at high spatial resolutions
- Improves upon the limitations of current PET imaging solutions that ignore the lifetime history of positrons

FEATURES/BENEFITS

- Healthcare and medical imaging
- Cancer staging and treatment planning
- Development and enhancements of PET scanners

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20250370148	12/04/2025	2022-579

CONTACT

Michael M. Mueller

mmmueller@ucdavis.edu

tel: .

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INVENTORS

- Huang, Bangyan

OTHER INFORMATION

KEYWORDS

positronium lifetime, lifetime image reconstruction, PET scanners

CATEGORIZED AS

- **Imaging**
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  - Diagnostics
  - Disease: Cancer
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University of California, Davis
Technology Transfer Office
1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

Tel: 530.754.8649
techtransfer@ucdavis.edu
https://research.ucdavis.edu/technology-transfer/
Fax: 530.754.7620

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