

TECHNOLOGY OFFER

A Camera for Accurate Real-Time Detection of Gamma Radiation Direction

An angle-sensitive camera has been developed for detecting the direction of incident gamma radiation. The camera senses, in real time, the position of the radiation source, which simplifies procedures in cancer radiation therapy and in other radiation-related industries.

The Problem:

In the current medical practice in radiation procedures in clinical oncology (high dose rate brachytherapy), catheters are surgically positioned through a malignant lesion of the patient. This is followed by the temporary insertion of a gamma-radioactive source into the catheters in order to locally deposit a therapeutic radiation dose over a volume of the lesion. These practices suffer from an absence of real-time feedback on the actual deposited radiation dose.

The Solution:

The invention, a camera, sensitive to the incoming direction of gamma radiation, solves this problem since it is capable of sensing, in real time, the position of the radiation source inside the treated patient and thus introduces a quality-control component to the radiotherapy procedures. The camera includes a processor which receives intensity data from a sensor, and determines the incident direction of the radiation from that data. The camera is operated and controlled via computer software.

Application:

The camera finds use in the fields of medical radiotherapy, specifically in high dose rate brachytherapy in clinical oncology. Other examples of use are in detection and localization of radioactive contaminations in nuclear medicine environments, and in nuclear power installations, as well as in real-time control of inventory and transportation of special nuclear material.

Advantages:

- the camera senses, in real time, the position of the radiation source inside the treated patient in a non-invasive manner
- unlike some existing complex solutions, involving complex detectors, readout, and interpretation of data, the invention involves a simple gamma ray detector and a corresponding readout system, making its use more economical as well as more accurate
- technology is conceptually simple and may be set up as a stationary device (for therapeutic applications), or installed on a remote-controlled element for increased safety (for applications requiring detection of radiation in potentially hazardous material, such as radioactive waste)

Stage of development:

The solution has been demonstrated and tested in the laboratory.

Intellectual property:

Patent application has been filed for the technology.

Type of partnership sought:

- license agreements and/or technical cooperation agreements with industry or research partners

CONTACT DETAILS

Dusko Odic, PhD
Center for Technology Transfer and Innovation,
Jozef Stefan Institute,
Jamova cesta 39, SI-1000 Ljubljana
<http://tehnologije.ijs.si>
Phone: +386 1 477 3287
E-mail: dusko.odic@ijs.si