TECHNOLOGY PRESENTATION

New material, method and apparatus for optical three-dimensional radiation dosimetry

TECHNOLOGY SUMMARY
The material and method enables providing a phantom (i.e., a model of a part of the human body), which can be subjected to radiation and subsequently be read out, revealing the three-dimensional dose distribution; the phantom can be used even in a strong magnetic field where electronic devices are not applicable.

APPLICATIONS
The technology is useful to validate advanced radiotherapy where a real 3D dosimetry method enabling verification of complex, and it is particularly valuable in particle therapy, where the range of the particle track is critical and the existing quality-assurance procedures are inapplicable.

CURRENT STATE
A prototype has been fabricated and used for initial experiments. Dosimeters in shapes for standard dosimetry read-out have also been created and used for validating a good dosimetric response.

INTELLECTUAL PROPERTY RIGHTS
All IP rights concerning the technology belong to Aarhus University and the Central Denmark Region; a patent is pending on the technology.

COMMERCIAL PERSPECTIVES
The technology has a wide range of benefits compared to other dosimeters. Some of these are described below:

- Reusable method – The material can be reset. This means that it is possible to reuse the dosimeters for new dose distributions.
- Archive function – It is possible to archive the dose distribution in the material for up to a month. This makes it possible to ship the dosimeter over considerable distances to an expert for further analysis.
- Solid material – The dosimeters are made of solid material. This means that shipping and handling the dosimeter without any supporting material is possible.
- Operational conditions – The material is not sensitive to any external conditions like temperature, humidity or magnetic field, and enable dose measurements in broad medical range.
- Flexibility – The dosimeter has potential to simulate 3D anthropomorphic shapes (e.g. specific organs) and their deformations during an irradiation procedure.
- Simple and inexpensive – The production method is based on mixing of readily and commercially available components.

BUSINESS OPPORTUNITY
Aarhus University is looking for a partner to help move the invention forward towards a commercial product that fits market requirements.

It is the immediate goal of Aarhus University to initiate a research collaboration with an external partner containing a licensing agreement.
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