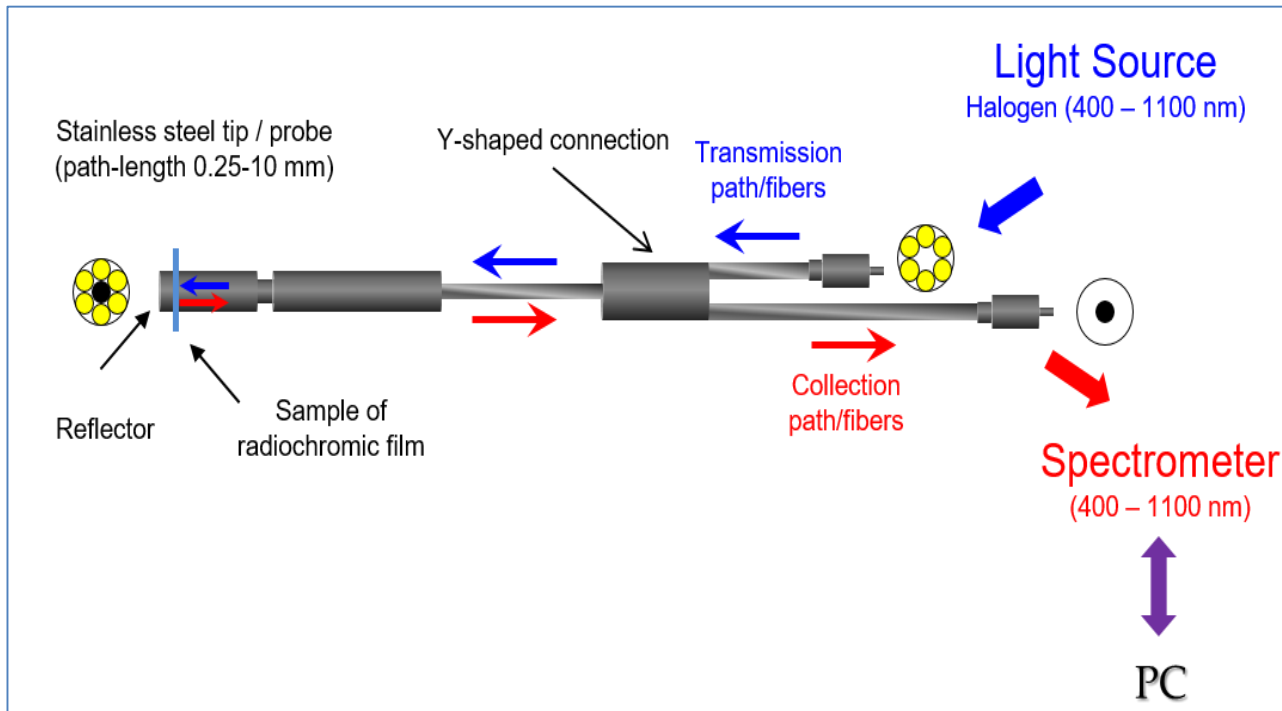


ON-LINE READING OF RADIOCHROMIC FILMS



PRIORITY NUMBER:

102018000000652

KEYWORDS:

Radiochromic Films

Optic Fiber

Ionizing Radiation

Dosimetry

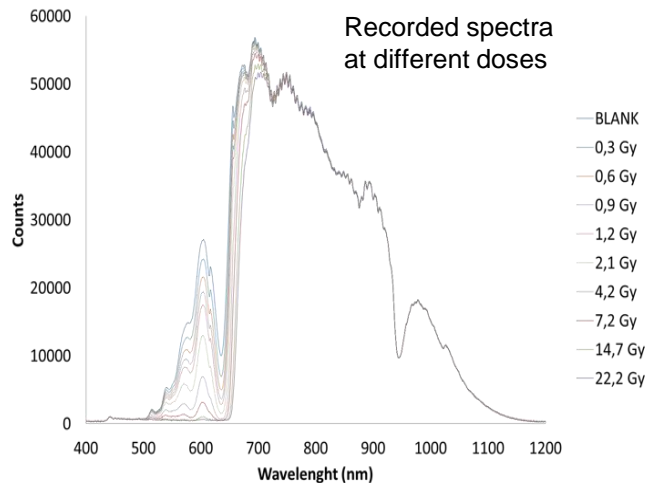
Real Time

A device based on optic fiber technology allows the reading of radiochromic films exposed to ionizing radiation, in real time and by remote control. The micrometric thickness and the low attenuation coefficient of the fiber, combined with the extreme versatility of the reading instrument, allow the system to overcome all the drawbacks of devices currently in use.



Istituto Nazionale di Fisica Nucleare

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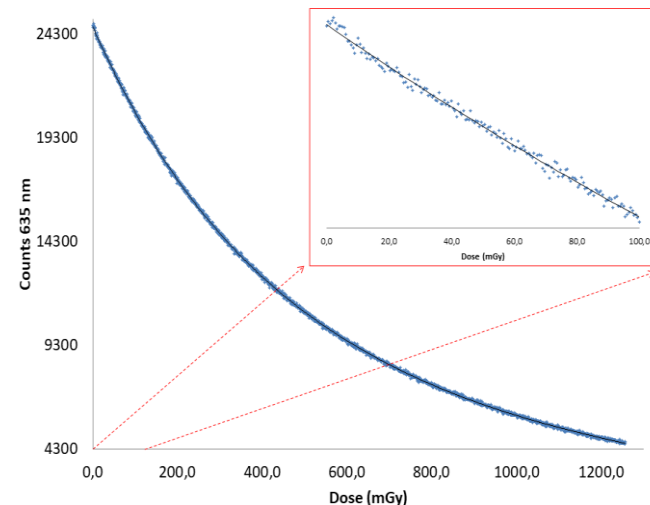


DESCRIPTION :

The reading of radiochromic films is currently carried out using commercial scanners, after the film has been exposed to radiation source. Such systems do not allow the evaluation of the amount of absorbed radiation at any given time, but they can only give an information about the integral dose.

The invention represents an alternative to the state of the art, proposing a system that makes use of fiber optic cables, both for irradiation and reading of radiochromic. Based on the alteration of the received signal, the reading can be performed in real time and by remote control. The irradiation of small film areas and the possibility of carrying out repeated exposures, up to saturation, reflect on a considerable reduction in the purchase costs of materials. Moreover, the device adapts well to the reading of different types of radiochromics, allowing to monitor dose levels from a few cGy to hundreds of kGy.

Calibration curve



ADVANTAGES:

- On-line dosimetry
- Remote control
- Multiple exposures and readings for the same film
- Small irradiation areas $< \text{mm}^2$
- Films interchangeability
- Extended dose-range

APPLICATIONS:

- Monitoring of environmental radiation, in landfills, in special materials deposits, in water purification systems and also in inaccessible experimental areas (nuclear reactors and irradiation facilities)
- Patient dose monitoring, in medical field
- Particle beams diagnostic
- Dose monitoring in foods during sterilization processes