OVERVIEW OF PHYSICAL AND BIOPHYSICAL TECHNIQUES FOR RADIATION ACCIDENT DOSIMETRY

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In this presentation we will give an overview of new physical and biophysical methods considered for radiation accident dosimetry. In the last few years, there was a renewed interest for retrospective dosimetry, especially in the light of the possible malevolent use of radioactive materials. There is some new effort to establish physical and biophysical methods mainly based on EPR spectrometry and luminescence techniques (OSL and TL) applied for large scale radiation accident dosimetry. These new methodologies used existing techniques applied on new materials, such as EPR X-band spectrometry (9.8 GHz) on plastic (glasses, mobile phone, watch, button,..), glass (watch, display windows of electronic devices) and nails, TL on glass, and OSL on chip cards (telephone card, credit card) and electronic components (mobile phone for example) or new technologies on well characterized materials such as in vivo EPR on tooth enamel using L band frequency (1.1 GHz) or Q-band frequency (34 GHz) EPR spectrometry on tooth enamel micro-biopsies.
We will achieve the state of the art of these new methodologies; discuss their advantages and disadvantages, the limits of applicability, and the complementariness with biological analysis methods such as cytogenetic for example.