

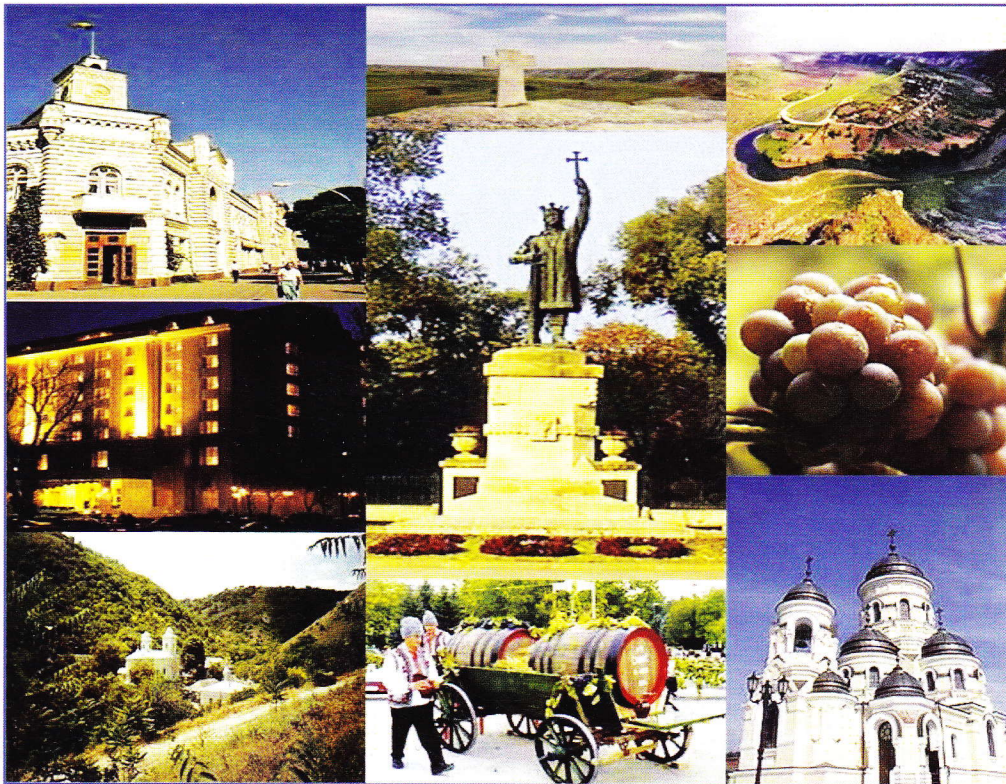
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Technological Innovations in Detection and Sensing of Chemical Biological Radiological Nuclear (CBRN) Threats and Ecological Terrorism

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PbS NANODOTS FOR ULTRAVIOLET RADIATION NANO SENSOR

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ABSTRACT: Radiobiological effects of ultraviolet radiation (UV) depend on interaction of photons with biomacromolecules (BMM) of a biological object and are induced by the absorbed dose. BMM are scaled to nanodimensions, therefore it is necessary to have a UV nano volumetric sensor. Detection of the signal by the sensor has to be provided from a nanovolume, indeed. Such the approach could be satisfied by the nanodot like sensor and by detection of its low energy electron emission, when a mean free path of the emitting electron is equal to several nanometers.

The PbS nanodots embedded in the zirconium oxide nanofilm (PSZONF) were explored as the possible UV sensor. Prethreshold ultraviolet emission measurements were made to detect signal from the PbS nanodots. Electron emission current of PbS nanodots correlated to UV exposure. This gave evidence that PSZONF system could be in use to reach UV nano sensor.

Keywords: ultraviolet radiation sensor, electron emission, PbS nanodots