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**BOOK OF
ABSTRACTS**

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Testing of low-cost dosimeters used in non-governmental networks within 16ENVo4 Preparedness project

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Recent advances in microelectronics and information technologies, along with the expansion of citizen science, have changed the way measurements are done in many scientific fields, including ionising radiation dosimetry. Many low cost user-friendly instruments are now available for purchase over the internet. Most of the instruments can be connected with applications for real time measurements, and some of them provide possibilities for real time upload to the specialized public websites. Low cost and low requirements for technical knowledge allow many laymen to perform measurements, and results can be easily disseminated via social networks and media outlets. These results are often not verified and low-cost instruments are usually not type tested, so there is a significant possibility for such results to cause misinformation of public or even unwarranted panic.

Research on non-governmental dosimetry networks has been conducted within the Work Package 3 of 16ENVo4 Preparedness, scientific project within the European Metrology Programme for Innovation and Research (EMPIR). The research has identified non-governmental networks with the densest networks and most active websites, because such networks have the largest potential impact on the public. Measuring instruments used in non-governmental networks (MINN) have been identified, and a total of 16 types of MINNs have been sourced, commissioned and tested in dosimetry laboratories of Vinca Institute of Nuclear Sciences (VINS), Serbia, Physikalisch-Technische Bundesanstalt (PTB), Germany, National Physics Laboratory (NPL), United Kingdom and Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA). The tests included linearity and energy dependence of the response in photon fields generated at each institute, determination of inherent background, response to cosmic radiation, response to small changes of background radiation and tests of dependence of the response on climatic conditions – humidity and temperature, at PTB facilities.

The research has shown that most of the MINNs are based on non-compensated Geiger Mueller tubes, with the consequence that the energy dependence does not conform to the requirements of relevant standards. Dead time correction is not performed in most low-cost instruments, but the linearity is within $\pm 15\%$ in the dose rate range of interest for environmental monitoring. Response to small changes in background dose rate is dependent not only on the radiation detector, but also on the software and the mode of operation selected by user. In field tests, most dosimeters were sensitive to small changes in background radiation.

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