

ЗБОРНИК РАДОВА



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**06-08. октобар 2021.
Београд, Србија**

**ДРУШТВО ЗА ЗАШТИТУ ОД ЗРАЧЕЊА
СРБИЈЕ И ЦРНЕ ГОРЕ**



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**EMPIR PROJECT 19NET04 MIRA – JOINT NETWORK PROJECT
SIGNIFICANCE**

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ABSTRACT

The 19NET04 MIRA Joint Network Project is a project within the EMPIR 2019 call. The main objectives of the project are to establish stakeholder dialogue, to develop the Strategic Research Agenda for the medical use of ionising radiation, to define how current European metrological services meet regulatory and stakeholder needs, to set up a knowledge-sharing programme for the stakeholders and to develop a plan for the European metrology research infrastructure via the European Metrology Network. The project addresses the strong need for a coordinated action on an international level in the different fields of ionising radiation which include medical applications, radiobiology and radiation protection.

1. Introduction

The European Association of National Metrology Institutes (EURAMET) is the Regional Metrology Organisation (RMO) of Europe, which has a goal to enhance benefits of metrology to the society by establishing a balanced European measurement infrastructure. In order to achieve this goal European Metrology Research Programme (EMRP) and European Programme for Innovation and Research (EMPIR) were designed, encouraging the collaboration of European National Metrology Institutes (NMIs) and Designated Institutes (DIs) with the partners in the industry and academia. The EMPIR programme enables collaboration of NMIs and DIs, industrial and medical organisations and academia in various fields including environment, health, energy, industry etc. Joint Network Projects are the projects which facilitate the process of establishing the European Metrology Networks (EMNs). Currently, there are seven established EMNs concerning the following areas: climate and ocean observation, energy gases, mathematics and statistics, quantum technologies, smart electricity grids, smart specialisation in northern Europe and traceability in laboratory medicine. In 2019 EMPIR call, two novel Joint Network Projects have been proposed relating to the area of ionising radiation metrology.

“19NET04 MIRA, Support for a European Metrology Network on the medical use of ionising radiation” is a Joint Network Project from the 2019 Support for Networks call. The project participants are 10 NMIs and DIs from Europe, which will serve as the basis for the creation of the future EMN.

This four-year project will enable facilities and services among the EMN participants and contributors to be shared. A Strategic Research Agenda (SRA) will be proposed for the following decade, while also defining the regulatory needs and offering the knowledge-sharing programme. The structure of the project consists of three work packages, and work packages regarding the impact of the project, and project management and coordination.

2. Project overview and objectives

Due to the rapid and constant development of medical imaging and radiotherapy techniques, there is a strong need for improvement in safety and efficiency of these procedures, by optimising dose delivery to the patient while achieving the desired diagnostic information or therapeutic results. This rapid evolution has induced changes in the International Atomic Energy Agency (IAEA) protocols, impacting metrology techniques, by increasing the complexity of the diagnostic and therapeutic procedures (i.e. MRI-LINAC devices, radiopharmaceuticals and diagnostic procedures using very short radiation pulses etc.). In order to appropriately assess the risk of potential side effects of such procedures, acquisition of accurate radiobiology data is necessary. By introducing shared complex and costly radiobiology facilities to the stakeholders among EMN, the large discrepancies between European countries' metrology infrastructure would be diminished. Currently, the metrology of ionising radiation used in medicine is well represented in standardisation bodies such as International Organisation for Standardisation (ISO) and International Electrotechnic Commission (IEC), but not in more clinically oriented societies such as European Society for Radiotherapy (ESTRO) and European Alliance for Medical Radiation Protection Research (EURAMED). The Joint Network Project would introduce high-level coordination of the metrology community by establishing facilitated stakeholder communication and knowledge sharing via the future EMN. In this way research and development, training and accessibility of metrological infrastructure among EMN members on a European level would be supported.

The specific objectives of the project would firstly be based on establishing constructive dialogue, workshops and similar, between the participating NMIs/DIs and the stakeholders which are involved in the medical applications of ionising radiation, where the communication would be primarily focused towards the research and standardisation. From the EMN point of view the stakeholders could be categorised into the following categories: (1) academic experts, (2) standards development organisations, (3) national and international bodies in the areas of radiation oncology and medical physics, (4) manufacturers of medical equipment, (5) medical staff and professionals. Posterior to the establishment of stakeholder communication, Strategic Research Agenda would be created in communication with the key stakeholders while taking into account the existing roadmaps and networks, such as EURAMED and the Multidisciplinary European Low Dose Initiative (MELODI), and applicable regulation [3]. The knowledge sharing programme for the stakeholders would be initiated in order to facilitate and enhance the exchange of researchers between organisations, promote events which include metrology based workshops, various stakeholder targeted events and training courses. A web-based platform would be created in order to provide accessibility of this programme to the stakeholders. The platform developed under the scope of the project should be maintained by the future EMN. The metrology network for the medical use of ionising radiation would need to be in alignment with existing EMNs and the Technical Committee for Ionising Radiation (TC-IR). The MIRA project EMN would promote the development of emerging member states and extend the collaboration to third countries.

3. Project impact

Constructive stakeholder dialogue in priority areas in the field of medical use of ionising radiation would allow complete overview of the gaps and the needs among European countries, with the goal of aligning activities between metrology, research and medical communities. The EMN proposed under the framework of the 19NET04 MIRA would have impact on the metrology community by improving the traceability of exposures during diagnostic, radiotherapy and radiobiology procedures. In order to improve traceability, the procedures used would need to be harmonised, supported by comparisons, and finally by studying correlations between radiation doses and potential biological effects. The consequential results would lead to the development of new standards allowing safer efficient use of medical exposure modalities. Providing the stakeholders across Europe with improved dosimetry and radiobiology capabilities would facilitate the study of stochastic radiation induced biological effects, resulting in better understanding of the radiation induced secondary tumours.

4. Acknowledgement

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5. Literature

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**EMPIR PROJEKAT 19NET04 MIRA – ZNAČAJ PROJEKTA ZA
USPOSTAVLJANJE METROLOŠKE MREŽE**

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SADRŽAJ

Projekat za uspostavljanje metrološke mreže 19NET04 MIRA predstavlja međunarodni projekat u okviru EMPIR 2019 poziva. Glavni ciljevi projekta jesu uspostavljanje dijaloga interesenata (stejkholdera), stvaranje strateškog plana razvoja za medicinske primene jonizujućeg zračenja, ispitivanje u kojoj meri trenutne metrološke mogućnosti evropskih instituta zadovoljavaju potrebe regulatornih tela i interesanata, postavljanje programa razmene znanja i razvoj plana za evropsku metrološku infrastrukturu putem evropske metrološke mreže. Projekat će dati odgovor na potrebu za koordiniranim aktivnostima na međunarodnom nivou u različitim oblastima primene jonizujućeg zračenja u medicini, radiobiologiji i zaštiti od zračenja.