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Cite as: AIP Conference Proceedings **1541**, 183 (2013); <https://doi.org/10.1063/1.4810838>  
Published Online: 10 June 2013

M. C. Ovejero, A. Pérez Vega-Leal, M. A. Cortés-Giraldo, Z. Abou-Haidar, A. Bocci, M. I. Gallardo, J. M. Espino, M. A. G. Álvarez, J. M. Quesada, and R. Arráns



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# Radia2: A New Tool for Radiotherapy Verification

M. C. Ovejero <sup>a</sup>, A. Pérez Vega-Leal <sup>b</sup>, M. A. Cortés-Giraldo <sup>a</sup>, Z. Abou-Haidar <sup>c</sup>, A. Bocci <sup>c</sup>, M. I. Gallardo <sup>a</sup>, J. M. Espino <sup>a</sup>, M. A. G. Álvarez<sup>a,c</sup>, J. M. Quesada <sup>a</sup>, R. Arráns <sup>d</sup>

<sup>a</sup> *Departamento de Física Atómica, Molecular y Nuclear (FAMN), University of Seville, 41012 Seville, Spain.*

<sup>b</sup> *Departamento de Ingeniería Electrónica, University of Seville, 41092 Seville, Spain*

<sup>c</sup> *Centro Nacional de Aceleradores (CNA), 41092 Seville, Spain*

<sup>d</sup> *Servicio de Radiofísica, Hospital Universitario Virgen Macarena, 41007 Seville, Spain*

**Abstract.** Radiotherapy is nowadays a proven technique in cancer treatments. Within the evolution of radiotherapy treatments towards more complex techniques, the need of new dosimetric methods for treatment verifications has appeared. In order to reach an improved dosimetric method, a collaboration was started to transfer knowledge from nuclear reaction instrumentation to medical applications, involving several departments from the University of Seville, Centro Nacional de Aceleradores (CNA), the Hospital Universitario Virgen Macarena and the company Inabensa. The first prototype, patent pending [2], gave very promising results. Currently, a critical review is being carried out to create an improved system.

**Keywords:** Dosimetry, instrumentation.

**PACS:** 87

## ORIGINAL BACKGROUND: A PATENTED METHOD

Due to the complexity of the advanced radiotherapy treatments with photons it is necessary to perform additional measurements prior to delivering radiation to the patient, in order to guarantee their efficiency. A novel method for complex radiotherapy treatment verification was developed and sent to patent [1, 2].

Our critical analysis of this original dosimetric method (Figure 1) gave new requirements to achieve an improved one, which is nowadays under development: a new phantom design, motor and data acquisition system, and a new software tool which integrates the measurements and data analysis process required to obtain the treatment verification.

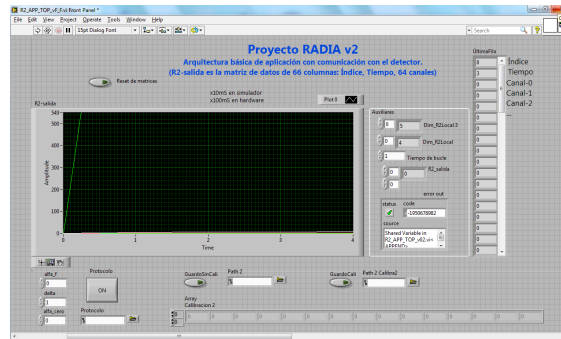


**FIGURE 1.** First cylindrical phantom prototype under the linac in the Hospital Virgen Macarena facilities.

## THE RADIA2 SOFTWARE TOOL

A new software tool has been developed with the National Instruments (NI) Labview software package in order to reach the integration of the whole process. A Virtual Instrument (VI) has been designed with the required functionalities which were defined in our critical analysis for the first prototype.

The new interface (Figure 2) allows the user to manage information coming from the electronic data acquisition system. Data can be stored, so that the user may decide between two storage data: previously calibrated or not calibrated. Also a data analysis can be applied, calling the desired functions already defined and tested in the first system prototype.



**FIGURE 2.** Interface window.

## REFERENCES

1. A. Bocci, M. A. Cortes-Giraldo, M. I. Gallardo, J. M. Espino, R. Arrans, M. A. G. Alvarez, Z. Abou-Haidar, J. M. Quesada, A. Pérez Vega-Leal, F. J. Perez Nieto, Nuclear Instruments & Methods in Physics Research. A 673, 96 (2012).
2. M. I. Gallardo, M. A. G. Alvarez, J. M. Quesada, A. Pérez Vega-Leal, Z. Abou-Haidar, A. Bocci, M. A. Cortes-Giraldo, J. M. Espino, R. Arrans, F. J. Perez Nieto, and J. Lopez-Dominguez, Submitted for Patent at the OEMP - Oficina Española de Patentes y Marcas - Ministry of Industry, Tourism and Commerce: Number P201101009 (13/09/2011).