



**9th International Topical Meeting on
Industrial Radiation and
Radioisotope Measurement
Applications
IRRMA-9**

**6-11 July 2014
Valencia (Spain)**

Book of Abstracts

The text of the published abstracts is the responsibility of authors.
Abstracts are printed in the wording sent by authors with no corrections.
They are typeset by authors.

IRRMA-9
Abstracts of the 9th International Topical Meeting on
Industrial Radiation and Radioisotope Measurement Applications

José Ródenas (editor)

Published by Projectem Comunicació (Violeta Martín Núñez)

336 pages, 200 copies

Printed by Martín Impresores

Copyright retained by authors

ISBN: 978-84-942137-5-5

Pulse Shape Discrimination of the New Plastic Scintillators in Neutron-Gamma Mixed Field Using Fast Digitizer Card <i>A. Jančář, Z. Kopecký, J. Dressler, M. Veškrna, C. Granja, M. Solár</i>	43
Characterization of the Graphite Pile as the Source of Thermal Neutrons <i>M. Králík, A. Jančář, Z. Kopecký, J. Dressler, M. Veškrna</i>	44
Effect of Ionizing Radiation on Rheological and Sensorial Properties of Honey Submitted to Medium Doses <i>A.D.T. Fabbri, J.A.M. Sagretti, S.F. Sabato</i>	45
Boiler leak detection in CCGT power stations utilising short lived radiopharmaceuticals <i>D. Watkins, M. Joyce</i>	46
Progress towards the production of ^{236g}Np standard sources <i>C. Larijani, P. Ivanov, S. Jerome, D. Parker, P.H.Regan</i>	47
Carbonate space porous media investigation before and after HCl acidizing <i>A.Paiva, A. C. Machado, A. Pepin, N. Bize-Forest, I. Lima, R. T. Lopes</i>	48
Ozone Rate Production at Cobalto-60 Facility <i>Costa, F. E. Uzueli, D. H., Rela, P. R., Vasquez, P. A. S., Hamada, M. M.</i>	49
A comprehensive investigation of chemical, mechanical and acoustic modifications in wood treated with high doses of gamma radiation for sterilization <i>G. Ricci, D. Mostacci, A. Borella, G. Falini, M. Garai, A. Liverani, R. Regazzi, L. Tositti</i>	50
A Study on 3D NIPAM Gel Dosimeter for Five-Field IMRT Dose Verification <i>Yuan-Jen Chang, Chin-Hsing Chen, Bor-Tsung Hsieh, De-Shiou Chen, Yuk-Wah Tsang</i>	51
Implementation of an automation system for manufacturing 3D polymer gel dosimeters <i>Ling-Ling Heieh, Chin-Hsing Chen, Bor-Tsung Hsieh, Yen-Chih Lin, Jay Wu, Yuan-Jen Chang</i>	52
Ionizing Radiation Applications for a Sustainable Environment: Food Preservation Processing by Gamma Radiation <i>A. L. Antonio, A. Bento, I. C. F. R. Ferreira, S. Cabo Verde, B. Quintana</i>	53
Electron beam irradiator for post-harvest processing of chestnut fruits: technical parameters and feasibility <i>A. L. Antonio, A. Bento, M. L. Botelho, B. Quintana, Z. Zimek</i>	54
A Novel Video-Based Optical CT Scanner Used in 3D Polymer Gel Dosimeter <i>Yuan-Jen Chang</i>	55
Cold Neutron Depth Profiling Technique for Studying Depth Distribution of Lithium and Boron in Production and Real Samples <i>Byung Gun Park, Gwang-Min Sun</i>	56
Detection of irradiated plant food supplement ingredients by thermoluminescence technique <i>C. Boniglia, B. Carratù, R. Gargiulo, S. Giammarioli, M. Mosca, M.C. Quattrini, E. Bortolin</i>	57

Electron beam irradiator for post-harvest processing of chestnut fruits: technical parameters and feasibility

A. L. Antonio^{1,2,3}, A. Bento¹, M. L. Botelho², B. Quintana³, Z. Zimek⁴

¹ CIMO-ESA, Polytechnic Institute of Bragança, Portugal

² Center for Nuclear Sciences and Technologies, University of Lisbon, Portugal.

³ Department of Fundamental Physics, University of Salamanca, Spain

⁴ INCT Institute of Nuclear Chemistry and Technology, Warsaw, Poland

Key Words: Food irradiation; Electron beam; Chestnut fruits; Feasibility

In a recent worldwide estimation, food irradiation processing represents about 400 000 ton, from which almost half (186 000 ton) were to eliminate insects. In EU Mediterranean countries chestnut fruits production represents a market of more than 100 000 ton, being Portugal the third producer with an amount of 20 000 ton, exporting 25% of the production, representing an income of about 15 million Euros. In March 2010, a European Union commission decision prohibited the use of methyl bromide (MeBr), a wide spectrum fumigant used for different agricultural purposes, namely for post-harvest disinfestation of chestnut fruits. The banning of MeBr could represent an opportunity to implement ionizing radiation treatment, as a well tested technology in other food commodities for post-harvest preservation.

Electron beam irradiators are more hardware sophisticated than gamma irradiators, however due to several factors they are becoming more popular and being the first choice, whenever the product can be treated by low penetration radiation.

Since the current focus for food irradiation is in e-beam versatility and advantages, it is presented in this paper a detailed analysis and discussion about technical characteristics and feasibility for post-harvest irradiation of chestnut fruits, taking in account the physical dimensions and fruits seasonality, beam energy, throughput and total costs of operation, to estimate the impact on the final price of the irradiated product.

amilcar@ipb.pt