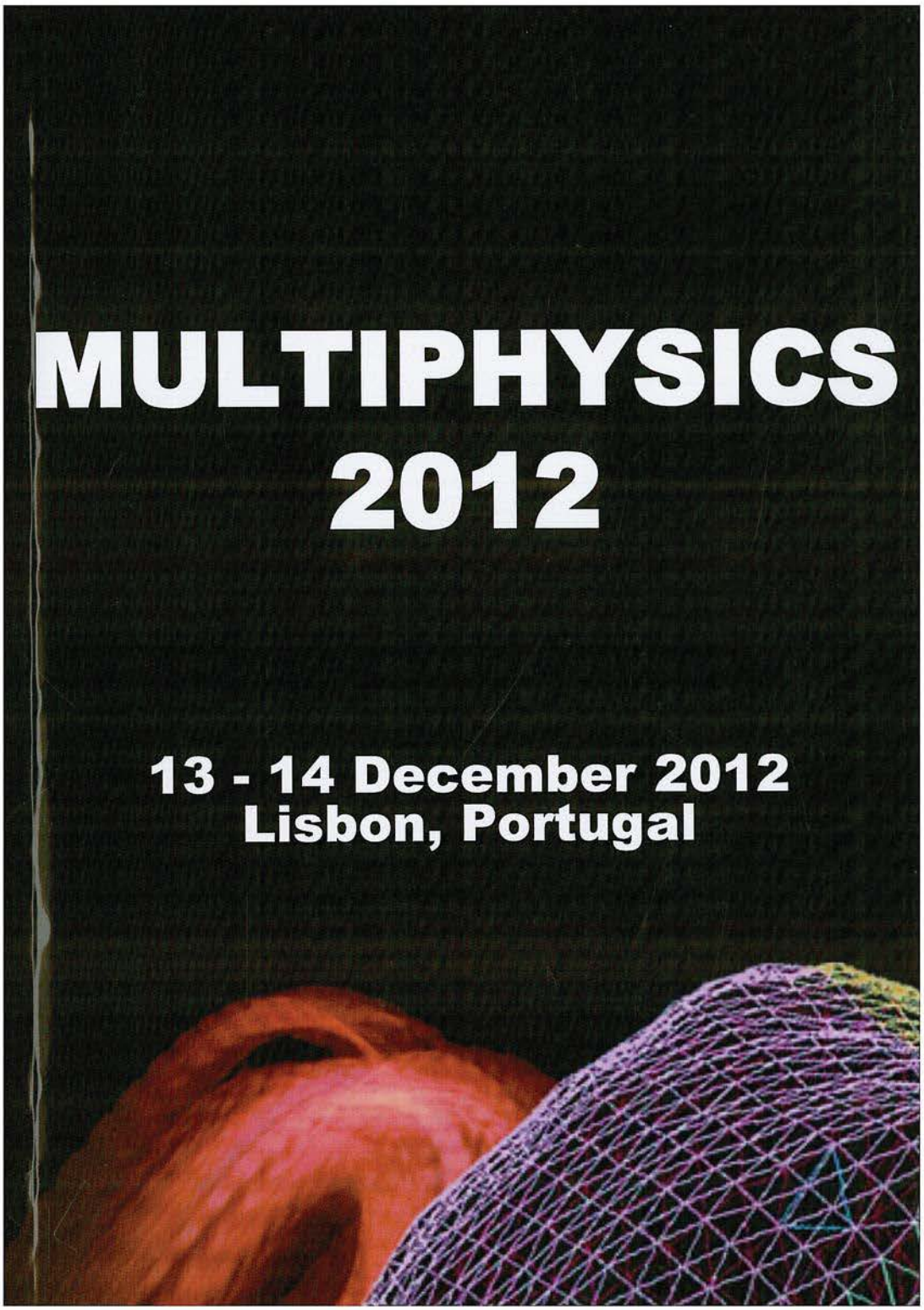
MULTIPHYSICS 2012

13 - 14 December 2012
Lisbon, Portugal



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PROGRAMME

TIME	Thursday 13 December 2012	Friday 14 December 2012
09:30 - 11:00	**Registration & Keynote Address**	**Session 2.1** *Micromechanics*
11:00 - 11:30	**Coffee Break**	
11:30 - 13:00	**Session 1.2** *Aeroelasticity & Fluid Structure Interaction*	**Session 2.2** *Electromagnetics & Wave Mechanics*
13:00 - 14:00	**Lunch**	
14:00 - 15:30	**Session 1.3** *Impacts & Explosions*	**Session 2.3** *Advanced Modelling Techniques*
15:30 - 16:00	**Tea Break**	
16:00 - 17:30	**Session 1.4** *Heat Transfer & Thermodynamics*	**Session 2.1** *Posters*
19:30	**Conference Banquette**	

COMPUTED TOMOGRAPHY IMAGES TO ASSESS THE DOSE IN IRRADIATED CHESTNUT FRUITS

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Food irradiation is an industrial process used for several purposes: decontamination, sterilization, disinfestation or to increase products shelf-life.
In chestnut fruits, irradiation appears as possible alternative for quarantine post-harvest treatment, due to recently being prohibited the use of methyl bromide, a toxic agent for the operators and for the environment [UNEP, 1995; EU, 2008]; The use of this technology is regulated by national and international food safety authorities, concerning the type of radiation used and, mainly, the dose applied to the product. The typical recommended doses for food processing are lower than 10 kGy but each product, due to its particular characteristics and inhomogeneities, must be submitted to a validation process. Chestnut fruits irradiation studies were done mainly in Asian varieties and only recently in European varieties (Castanea sativa Mill.) [Antonio et al., 2012]. Computed Tomography (CT) images are currently used to give support to clinical dosimetry for a better planning in radiotherapy. In this preliminary study we used CT images to characterize the density of the inhomogeneous fruit and to validate the effective dose in irradiated chestnuts. The absorbed dose was measured in fruits phantoms using two types of dosimeters, a reference dosimeter, Fricke solution, and a routine dosimeter, Amber Perspex. We present the densities for outer shell, inner skin, and fruits flesh, obtained from the CT images, and compare the results of the two dosimetric systems. Using these procedures, we could conclude that the absorbed doses are well characterized and guarantee that the dose validation in an irradiation process respects the recommended food irradiation regulations.

Keywords: food irradiation, chestnut fruits, computed tomagraphy, dosimetry