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Born in Roma (RM) on the 10th of May, 1984.

Degree: Biomedical Engineering, 2012
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PhD. Section: Microtechnologies and Devices for Biomedical and Nuclear Applications
(ex Ingegneria dei Microsistemi)

Title: Single Crystal Diamond Detector for “in vivo” dosimetry in Radiology Applications.

Tutor: Prof. Aldo Tucciarone

Co-Tutor: Prof. Marco Marinelli

Abstract: New synthetic single crystal diamond dosimeters (SCDDs) in a Schottky diode configuration, realized in the laboratories of the University of Rome “Tor Vergata”, may be an appropriate candidate for the measurement of the dose in radiology applications. The suitability of these small volume detectors for dosimetry in radiotherapy application was already assessed, showing very good dosimetric properties in comparison with reference commercial detectors commonly used in the clinical dosimetry.

International recommendations and national regulations require that doses received by patients and professionals involved in the radiological procedures be monitored. The PhD research activities will be focused on the realization and characterization of novel SCDDs in order to use them for in vivo dosimetry in interventional radiology and for dose reconstruction in case of overexposure. Crystal growth parameters, detector sensitivity, device design and new encapsulation techniques will be optimized in order to meet specific requirements for different radiology applications. Particular care will be devoted to the size of the device and to the mode of operation, which can be chosen between on-line and off-line. The dosimetric properties of the realized in vivo dosimeters will be evaluated by means of preliminary tests under soft X-ray irradiation at “Tor Vergata” University laboratories and dosimetric measurements in clinical photon beams at “Tor Vergata” General Hospital in Rome.