Seminar na doktorskom studiju Fizika

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Mjesto: *uživo* O-153 Fakultet za fiziku, Sveučilišni kampus, Radmile Matejčić 2
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Determination of field output and volume averaging correction factors in narrow Co-60 beams for different detectors

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Abstract

Small photon beam dosimetry refers to the determination of an absorbed dose in a photon beam whose size is smaller than 4x4 cm^2. Dose distribution on Gamma Knife is approximately spherical and characterized by a steep dose gradient with a diameter of 4, 8 or 16 mm. Small photon beam dosimetry is complex due to the small detector's spatial resolution, loss of lateral charged particle equilibrium and perturbation of electron fluence by the detector. This work aims to experimentally determine field output correction factors and measurement uncertainties for different detectors with the determination of the volume averaging correction factors. Field output factors are determined with passive (EBT3 film) and active detectors whose value are compared against the reference ones. Results of field output factors with active detectors are in better agreement with the EBT3 film than Monte Carlo simulations. The volume averaging correction factor is determined by simulating the detector's geometry and position within the 3D elliptical dose model. In addition, dose profiles are measured with different detectors and the most suitable type of detectors for dose profile measurements in nonreference geometry are determined.