deviation of 30% was observed. For TLD, the deviation to the mean value increases with distance and this tendency is more pronounced for the lower energy beam (up to 30%), indicating a possible effect of energy dependence. With these short and intense dose pulses, all techniques provided results in good agreement and therefore no effect of pulsed irradiation greater than inter-technique variability was observed.

ID_071

Title of the abstract: Calibration of 90Sr /90Y Ophthalmic Brachytherapy Planar Sources Using Thermoluminescent Samples, a PMMA Phantom and Monte Carlo Simulation

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Abstract: In some parts of Brazil, 90Sr/90Y clinical applicators are still used for dermatological and ophthalmic treatments, despite the availability of new technologies worldwide and the use of Ru-106/Rh-106 Eye Applicator. This is because they are less expensive and easier to use. Calibration and periodic recalibration of these applicators to verify the absorbed dose rate are essential to ensure accuracy in clinical treatments. In this study, the thermoluminescent response of LiF pellets was evaluated to determine the reproducibility, linearity of response, and dose-response curves. Dose rates for some clinical applicators were determined using the LiF pellets, a PMMA phantom and the Monte Carlo method, following a project based on ISO 21439 (2009). This standard recommends the use of small detectors such as LiF for this type of calibration.

ID_072

Title of the abstract: TSL properties of Ce-doped LiMgAlF6

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Abstract: Luminescent materials have been used to detect ionizing radiations for a long time. When ionizing radiations are absorbed by luminescent materials, some materials can store the absorbed energy by a form of carrier trapping. Under thermal and optical stimulation, these trapped carriers are re-excited and recombine at luminescent centers, and these phenomena are called thermally stimulated luminescence (TSL) and optically stimulated luminescence (OSL). Since the intensity of luminescence is proportional to the incident dose, TSL and OSL materials have been used for dosimeters.

Up to now, some Li-based fluoride including LiSrAlF6, LiCaAlF6 and LiMgAlF6 have been investigated in TSL and OSL properties. When Eu2+ was doped, these materials showed a very high TSL and OSL efficiency comparable to commercial materials. In Ce-doped LiSrAlF6 and LiCaAlF6, they showed a high TSL efficiency and medium level OSL response. Following these studies, in this work, we focused on Ce-doped LiMgAlF6.

Ce 0 (undoped), 0.01, 0.1, 1, 2, and 5% doped LiMgAlF6 ceramics were synthesized by the spark plasma sintering (SPS) method. The SPS method gives a reductive atmosphere so many trapping sites can be generated during the synthesis. After the synthesis, the sample size cut and polished to 10 mm × 1 mmt. To investigate the phase, XRD patterns were checked. Photoluminescence (PL) excitation, emission, and decay times were evaluated. Then, TSL glow curves and dose responses of these samples were evaluated.

In XRD, main peaks were identified as those of the LiMgAlF6 phase, and it roughly agree with the past result. Small unidentified peaks are also found in all the XRD patters, and they can be ascribed to impurity phases containing MgF2 and AlF3. When doping concentration became higher, small peaks due to CeF3 were also observed. Upon excitation at 260 nm, PL emission peaks were observed at 280 and 320 nm with typical decay time of ~32 ns. Under comparison with Ce-doped LiSrAlF6 and LiCaAlF6, PL emission origins