agreed reasonably well. The average quality factor $\bar{Q}$ of the radiation field obtained with the 2 detectors has shown good agreement for Ar and Ne ions ranging from 1.54% to 11% while some discrepancies between the two detectors of around 15 % were observed for no Al or thin Al wall in case of C, Fe and Si ions.

Some discrepancies observed can be related to the fact that the TimePix is measuring dE/dX that is higher than the y due to escaping high energy delta electrons from SV in SOI microdosimeter that is typical for high energy ions like in this experiment. SOI microdosimeter and TimePix can provide the Hp(10) and Q values as well as LET instantly through microdosimetry approach and via data processing of tracks, respectively. Both detectors are suitable for dose equivalent monitoring for astronauts in space.

ID_158

Title of the abstract: Characterization of mammography digital detectors

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Abstract: Recent measurements introduced in quality control protocols indicate large variations in the evaluated parameters, pointing out as its main cause the different detectors used. The objective of this work was to characterize, in terms of signal transfer property (STP) and noise component analysis (NCA), five mammography digital detectors at different dose levels for a variety of beam qualities. A Carestream EHR-M3 CR detector and Planmed Clarity, Siemens Opdima, GE Pristina and GE Crystal Nova DR detectors were characterized in terms of STP and NCA, as a function of detector air Kerma (DAK) at the X-ray detector input plane, in the range of 4 to 1000 μGy. A PTW Unidos E with PTW Freiburg ionization chamber was used to measure DAK. Attenuated beam qualities (obtained by adding 2 mm Al to the corresponding beam qualities) used were 28 kV with anode/filter combination Mo/Mo for the EHR-M3, Opdima and Pristina detectors; 28 kV with W/Rh for the Crystal Nova; 28 kV with W/Ag for the EHR-M3 and Clarity detectors; and 34 kV with Rh/Ag for the Pristina. STP measures the relationship between the input (DAK) and the output (pixel value) detector signals. NCA gives the fraction of total noise of each of its components and was calculated from the variance in mean pixel value. Both parameters were determined under stipulated (geometric and irradiation) conditions given in EUREF quality control protocol (2013). CR detector showed a logarithmic response and DR detectors showed linear response in the tested dose range ($R^2 > 0.999$). Response function was also influenced by the kVp and anode/filter combination used. W/Ag and Rh/Ag beams presented higher slope and intercept for EHR-M3 and Pristina, respectively. NCA showed that Opdima and EHR-M3 detectors are quantum limited below 270 and 900 μGy, respectively. For higher dose values, structure noise is the dominant noise source. For the Opdima detector, structure noise is related to the presence of wide range inhomogeneities in the data, while for CR detectors, it is related to the phosphor grain size. All other detectors are quantum limited in the dose

range evaluated. The findings show that the signal transfer and noise characteristics are influenced by the properties of the detection system. Moreover, STP was influenced by the beam quality.

ID_159

Title of the abstract: Optically stimulated luminescence properties of In-doped CsBr translucent ceramics

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Abstract: Luminescent materials used in radiation detectors are classified into scintillators and dosimeter materials. Scintillators immediately convert ionizing radiation into visible photons after absorbing the energy of radiation. On the other hand, dosimeter materials temporally store carriers at localized trapping centers in the host materials after absorbing the energy of radiation. The carriers are released when exposed to external heat or optical energy stimulation. The phenomenon induced by irradiating optical energy is especially classified as optically stimulated luminescence (OSL). The dosimeter materials are used in personal dose monitoring and imaging plates (IPs). In the application for IPs, the following properties are required for the materials: high luminescence output, effective X-ray absorption, wide dynamic range, fast decay time, and low fading. In terms of luminescence output, transparency of the materials is important because it can avoid the self-absorption of emissions from inside the materials. Furthermore, the interaction cross-section for X- rays is proportional to ρZeff4, where ρ and Zeff are respectively density and effective atomic number; hence the materials having large Zeff are preferred for the applications. In the study, we developed In-doped CsBr translucent ceramics by the spark plasma sintering method. CsBr (Zeff: 49.5) is one of the host materials of commercial IPs. Our past studies demonstrated that Tl-doped CsBr became a transparent ceramic form by the SPS method, and it showed good OSL dose response properties. As a luminescent center, In was selected because In+ showed the emission due to the 3T1u–1A1g transitions at 500 nm, which is the same emission origins as Tl+. CsBr translucent ceramics doped with various concentrations of In (0.01, 0.1, 0.5, and 1%) were synthesized by the SPS method. The photoluminescence and optically stimulated luminescence properties were evaluated. All the samples showed a broad emission at 500 nm by irradiating light at 630 nm after X-ray exposure. When the OSL dose response functions were evaluated, the 0.01, 0.5, and 1% In-doped samples showed good linearities between the X-ray exposure dose and OSL intensities from 0.01 to 100 mGy. In this presentation, we also present the photoluminescence and detector properties.

ID_160

Title of the abstract: Investigation on thermally assisted optically stimulated luminescence signal in natural CaF2

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