Abstract Submitted
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Genetic Assessment of the Space Environment using MEMS Technologies\f1[1] DILIP JANA, DILEON SAINT JEAN, SIYOVUSH ABDURAKHIMOV, VARUN KOPPARTHY, GERGANA NESTOROVA, NABAMITA PAL, NAM NGUYEN, PEDRO DEROSA, LEE SAWYER, NIEL CREWS, MARK DECOSTER, Louisiana Tech University, LOUISIANA TECH UNIVERSITY TEAM — h $-abstract-$\pard For decades, researchers have studied the damage to DNA by high-energy radiation. Radiation induced damage include DNA strand breaks, base damage and base substitution. Currently, though, scientists are discovering that it is, in fact, the non-irradiated cells adjacent to the irradiated cells are the primary source of carcinogenesis. To address these "bystander effects", we developed a radiation detector using multi-clad scintillating fibers and silicon pixel arrays to study the effect of radiation on gene expression changes using Microelectromechanical systems (MEMS) technology. The efficiency of proton energy deposition on each of the different layers of the radiation tracking detector has been simulated using GEANT4 toolkit and tested experimentally using the detector. The position of the proton beam was determined from the intensity of the output signal from orthogonal planes of the tracking detector. We have developed and tested an instrument that automates the extraction and quantification of RNA from living cells that automates the collection, purification, and reverse transcription (RT) of RNA from a precisely-defined area of the biological sample. \pard-/abstract-\

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