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**Gamma Radiation Tolerance of Magnetic Tunnel Junctions** FANGHUI REN, ALBRECHT JANDER, PALLAVI DHAGAT, School of Electrical Engineering and Computer Science, Oregon State University, CATHY NORDMAN, NVE Corporation — Determining the radiation tolerance of magnetic tunnel junctions (MTJ), which are the storage elements of non-volatile magnetoresistive random access memories (MRAM), is important for investigating their potential application in space. In this effort, the effect of gamma radiation on MTJs with MgO tunnel barriers was studied. Experimental and control groups of samples were characterized by *ex situ* measurements of the magnetoresistive hysteresis loops and I-V curves. The experimental group was exposed to gamma rays from a $^{60}$Co source. The samples initially received a dose of 5.9 Mrad (Si) after which they were again characterized electrically and magnetically. Irradiation was then continued for a cumulative dose of 10 Mrad and the devices re-measured. The result shows no change in magnetic properties such as coercivity or exchange coupling due to irradiation. After correcting for differences in temperature at the time of testing, the tunneling magnetoresistance was also found to be unchanged. Thus, it has been determined that MgO-based MTJs are highly tolerant of gamma radiation, particularly in comparison to silicon field-effect transistors which have been shown to degrade with gamma ray exposure even as low as 100 Krad [Zhiyuan Hu. et al., IEEE trans. on Nucl. Sci., vol. 58, 2011].

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