The FLASHMOD project –Hydrogen peroxide formation: UHDR vs CONV

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In this work the formation of hydrogen peroxide (H2O2) is measured after irradiation of ultrapure water with the ARRONAX proton beam under Ultra-High-Dose-Rate (UHDR) conditions and compared to conventional mode. A FLASH Effect was observed under Air in UHDR conditions attributed to the reaction of aqueous electrons e-aq with the precursors of H2O2 formation. In order to investigate this hypothesis, irradiations under Argon gas and with solutions saturated with nitrous oxide (N2O) as an effective scavenger of the aqueous electron e-aq are proposed. H2O2 G-values obtained are used as experimental data to compare with Geant4-DNA (under development) Monte-Carlo simulations of water radiolysis under UHDR conditions in the FLASHMOD project.

Orateur: FIEGEL, Vincent (ICO - Institut de Cancérologie de l'Ouest, Saint-Herblain) **Classification de Session:** Pôle Effets des Irradiations sur le Vivant