



Contribution ID: 38

Type: **not specified**

16-Life Prospecation on Mars - Studying the Martian Subsurface Radiation Environment

Wednesday 16 February 2022 12:34 (13 minutes)

This Thesis aims to study the martian subsurface radiation environment and to evaluate the survivability of extremophile organisms in the subsurface of Mars by analyzing the effects of this radiation environment on DNA molecules. The work is based on 2 main steps: First, modeling the Linear Energy Transfer spectrum in water of the ionizing field created by incident cosmic rays and solar event particles at different depths of the Mars subsoil up to 3m, using the detailed Martian Energetic Radiation Environment Model, and second, simulate the early radiation-induced damage on a simplified model of the DNA molecule, using the Geant4-DNA extension.

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