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Modelling and measurements of cosmic-ray related muon-fluxes in the Huguenot Tunnel near Paarl (Western Cape, South Africa)

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Abstract content ** ** (Max 300 words) **Formatting &** **
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A project was initiated to explore the feasibility of establishing a South African underground laboratory in the Huguenot Tunnel (near the town of Paarl, Western Cape, South Africa).

It is envisaged that such a laboratory will be used for, amongst others, low-level radioactivity measurements, using for example high-resolution gamma-ray spectrometry. The rationale for performing these measurements underground is that the rock overburden provided by the Du Toitskloof Mountain above the tunnel provides shielding against cosmic-ray related muons, thereby reducing background in the gamma-ray spectra.

In order to measure the cosmic muon flux in the Huguenot Tunnel we are preparing to a system comprising six plastic scintillator detectors and a digital signal processing-based data acquisition system. We present test results from measurements with this system at iThemba LABS.

We also present results from simulating cosmic muon fluxes in the Huguenot tunnel using the MUSIC (MUon Simulation Code) code. MUSIC is software package used for simulating muon transport through matter. The code takes into account the energy loss of muons due to ionisation, bremsstrahlung, pair production and muon-nucleus inelastic scattering.

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