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GeoProfiler a geological and radiological tunnel optimization tool

The CERN SCE/SAM-TG team is developing a web tool, named "GeoProfiler", to perform geological and radiological analysis of an accelerator tunnel based on its geometry and location. This tool will be used to support two future accelerator projects at CERN: the FCC and the Muon Collider.

The GeoProfiler tool's main functionality is to calculate, from a list of coordinates describing a tunnel, its intersection with several geological layers (for instance: limestone, molasse, etc.). The user can visualize this intersection via a geological profile chart and by changing the location and orientation of the input geometry in the tool he is able to explore the configuration space in order to minimize factors contributing to the construction effort/risk (for instance: intersection with key layers, depth of the shafts, etc.).

Moreover, the tool allows to analyse the extended direction of beam motion from key straight-line sections within the input geometry and to locate in a map the areas where these lines intersect with the surface, identifying where neutrino flux could be observed for a given accelerator scenario.

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