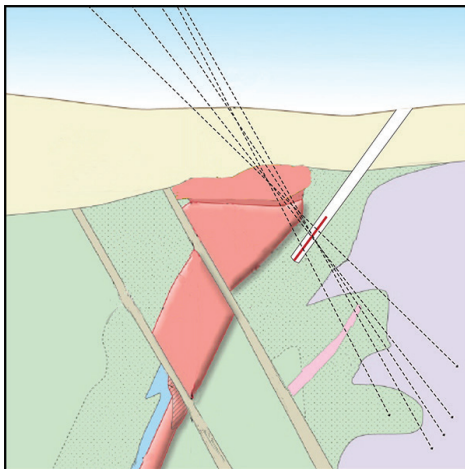


Lingacom's underground mapping

Mineral exploration, underground soil densities mapping

Lingacom's "underground exploration using cosmic ray muons" maps the underground soil densities using muons. The mapping extracts information on the depths of the geological layers and the soil densities above the muon detectors. The concept relies on high-energy cosmic ray muons penetrating the earth and collected by dedicated muon borehole detectors. The data collected by each borehole detector is used to map the weight of the ground above the detector in several directions. Cosmic ray muons are part of the naturally occurring cosmic radiation and are the most-penetrating charged particles on earth.

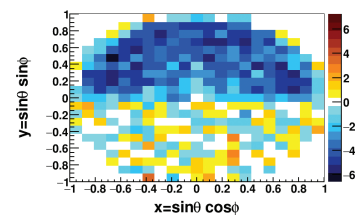


Underground mapping using cosmic ray muons



How does it work?

The muons arrive at the earth's surface with energies ranging from less than one GeV to thousands of GeVs. The muons lose energy as they travel through matter, with the energy loss proportional to the transversed mass. The denser rocks result in larger energy loss and in fewer muons that penetrate through these rocks. The map of the rates of muon arrival from different directions by the underground detector provides a map of the weight above the detector. This solution radically changes the underground mapping which currently consists in digging boreholes in the region of interest to analyze the underground soil. The data is collected by dedicated muon detectors inside the borehole. The collected data is used to perform muon tomography of the surrounding soil to localize denser objects such as minerals materials (uranium, gold, and copper), by providing information on the ground far from the borehole. This innovative solution reduces the number of expensive drillings.



Underground mapping

Lingacom cylindrically shaped imaging detector

Lingacom develops and fabricates the cylindrically-shaped detectors that are based on ionization and electron multiplication in a gas. The key advantages of Lingacom's detector technology are:

- ❖ Simple production process (PCB based)
- ❖ Low cost
- ❖ Support high spatial resolution
- ❖ The gas mixture used is completely safe and chemically very stable.
- ❖ Not sensitive to temperature.



Lingacom cylindrically shaped imaging detector