

Abstract

Investigation of Geological conditions with destructive borehole is increasing in several domain such as geological, geotechnical and environmental engineering. It represents a rapid and cost-efficient method in order to diagnose geological rock formation. However, the weak point is that by-product of this drilling method is that it produces small rock fragments (cuttings) instead of full rock cores. These rock fragments provide only discontinuous information which complicate petrographic observation and interpretation. Usually, these rock cuttings are simply observed under binocular loupe and their petrographic nature is determined and a facies recognition is established.

Rock cuttings characterization represents a challenge. In this study, micro-CT has been tested to improve the characterization of rock cuttings by defining their properties through morphological or intrinsic indicators

The shape, volume, surface, porosity and X-ray attenuation characteristics were analyzed on selected rock fragment. The Targets of this study is the differentiation of five types of rock. For this, real cuttings from well documented borehole (DB-cuttings) and analogous lab produced cuttings (DL-cuttings) were used to evaluate cuttings CT variables under real and lab conditions

Based on our results, DL-cuttings and DB-cuttings were significantly differentiated regarding the five types of rocks. Consequently, micro-CT could be valuable method to complement the present classical protocols for rock cuttings characterization. Its limitation according to the specific rock types remains an open question to be studied.

Key words: Geological engineering, Destructive borehole, Cuttings, Micro-CT, X-ray attenuation, rock type.