

Paper Number: 2494

## **Remote sensing and airborne geophysics for geological mapping of the Tefedest terrane (Central Hoggar, Algeria).**

Djemai, S.<sup>1</sup>, Amara, M.<sup>2</sup>, Bendaoud, A.<sup>1</sup> and Hamoudi, M.<sup>2</sup>

<sup>1</sup>LGGIP/FSTGAT/USTHB, BP. 32, El Alia, Bab Ezzouar, 16111, Algiers, Algeria. safouane.djemai@gmail.com

<sup>2</sup>Geophysic laboratory, FSTGAT/USTHB, BP. 32, El Alia, Bab Ezzouar, 16111, Algiers, Algeria.

---

The Tefedest terrane in the southern part of Algeria represents a Proterozoic block structured in four units, which belong to the Touareg shield and corresponding to arid terrains. The aim of this study is to carry out geological maps at 1/200 000 on GIS software, to report the outcropping basic dykes and to characterize the mega-shear zones that dislocate this area.

This work emphasizes two methods. The first is based on Landsat 8 OLI and ASTER multispectral satellite Sensor data. The enhancement of the different spectral information, which is given by these sensors (Color Composite CC, Band Ratio BR, Principal Component PC, Minimum Noise Fraction MNF, ...), were very helpful to highlight the contrast of spectral signatures therefore discriminate the variety of the lithologies that were represented in this area.

The second section of this study focuses on the airborne geophysical data campaign where two types of measures were acquired. Magnetic rocks susceptibility deduced through the magnetic field survey, which is gridded in 2 km cell size resolution in accordance with the DGRF 1975 were re-gridded on a pole-reduced map. The second measure lean on the radioactivity emitted by surface rocks also acquired in airborne campaign, and generated on a radiometric map of the Total Count channel (TC) within a 2 km cell size resolution.

Contributions given by the exploitation of these airborne geophysical maps were very efficient for the appreciation of the geological body on the surface and their distribution in depth, which will allow investigating the several basement faults that structured the block of this study area. Also the aero-radiometric map was very helpful to highlight and improve the different lithological contrasts emerged through the spectral enhancement of the satellite optical sensors. Finally, to validate and complete this work, several field work missions were carried out. A 1/200 000 geological map of the Tefedest terrane and conceptual model of the dislocation of this block express the result of this work.

