

## Distribution of hydrothermal alteration rock in the Arta, geothermal area of Djibouti based on ASTER image

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The research area is located in Djibouti, in the Afar depression, which is the meeting point of the Red Sea in the North, the Gulf of Aden in East and African rift in the South-West. The Arta Geothermal field is located on a broad valley lying on the Gulf of Tadjourah approximately 30 km east of the Djibouti City. The area has an elevation of 0 m to about 720 m dissecting the ragged hills on both side along the access road. The fumarole point and alteration zone are located on the edge of wadi which is widely eroded. The mountains around are deeply dissected showing older topographic characteristics. The main objective of this research is mapping hydrothermal alterations. The image Aster L3A acquired on June 12, 2005, was used in this study. Atmospheric correction was applied by using Fast Line-of-Sight Atmospheric algorithm (FLAASH) and then flowing by Minimal Noise Fraction(MNF) in order to reduce the noise from the image. The analysis of Aster image for Arta has been successfully used to identify hydrothermal alteration. The false color composite image RGB: B4, B6 and B8 has highlighted the distribution of hydrothermal alteration of Arta. The Relative Band Depth and Principal Component Analysis have well confirmed the type of alteration which represents the study area. The results indicated that the alterations are located in the Rhyolite intrusion (Argillic alteration and Phyllic alteration) surrounded by propylitic alteration