

## ABSTRACT

Ecuador has a mining potential that has not yet reached an appropriate development; in some cases, the exploitation of materials is carried out in the open pit. One of the most important stages is the monitoring of land displacements in the removal of materials. The present work was to quantify the displacement terrain using the Differential Interferometry SAR (D-InSAR) technique from radar images of the Sentinel-1 platform in the mining area “Concesión Minera Ashpachaca.” Interferograms of the mine area were created using the SNAP software and the SNAPHU algorithm, which allowed us to estimate the displacement suffered in the 2015-2019 period.

The applied methodology starts from obtaining satellite images through the Alaska Facilities Service (ASF) website, followed by processing using the SAR Differential Interferometry technique. Finally, through the aggregation of interferograms, the annual ground displacements were calculated. At the pixel level, the maximum estimated values within the study area were -0,27 m, -0,11 m, -0,26 m, -0,26 m, -0,19 m, for the years 2015, 2016, 2017, 2018, 2019 respectively. The total volume of material displaced to the study area was 39,435 m<sup>3</sup>, 13,941 m<sup>3</sup>, 33,219 m<sup>3</sup>, 34,778 m<sup>3</sup>, 20,506 m<sup>3</sup>. For the years 2015, 2016, 2017, 2018, 2019, respectively. The SAR Differential Interferometry technique seems to have great potential for estimating land displacement and monitoring mining activities.

Keywords: Removal, Displacement, SAR Differential Interferometry, Concession, Mine, Interferogram.

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