MORPHOTECTONIC RESPONSE (UPLIFT AND EXHUMATION) OF LITHOTECTONIC BLOCKS ADJACENT TO THE ANTIOQUEÑO PLATEAU (NORTHERN ANDES): A THERMOCRONOLOGY

ANALYSES APPROACH

ABSTRACT
Our undergraduate investigation deals with the need to create more coherent thermotectonic models that explain the co-evolution of juxtaposed morphotectonic provinces within the Antioquia Central Massif (ACM); an igneous/metamorphic province located in the northern portion of the Central Cordillera of Colombia. The central segment of Andean Central Andes at the eastern margin of the Cauca River trough, dating the tectonothermal and morphotectonic history of lithotectonic blocks. Preliminary results of this study are discussed, including new thermochronology and geochronology datasets that help elucidate the development of more coherent morphotectonic models that explain uplift/exhumation patterns of juxtaposed morphotectonic provinces within the Antioquia Central Massif.

Keywords: Northern Andes, Cauca River trough, zircon U-Th-Pb geochronology, Delitral-igneous apatite/zircon thermochronology, U/Pb, exhumation, Caribbean Sea, Andean valleys, Pueblito Diorite, Heliconia Diorite, Uplift/Erosion/Exhumation.

STUDY SITE
The Antioquia Central Massif, under study, is located in the Central Cordillera of the Colombian Andes, a transpressional geodynamic environment given by the interaction of the plates of South America, Nazca and the Panamá-Choco block.

PROBLEM DEFINITION
Low temperature thermochronology on Mesozoic plutonic masses along vertical profiles in the Cauca River trough may allow the development of more coherent morphotectonic models that explain uplift/exhumation patterns of juxtaposed morphotectonic provinces within the Antioquia Central Massif.

METHODS
Goal: Introduce the process by which samples of apatite and zircon are prepared for thermochronological studies dating from (U-Th)/He, Ar/Ar, K/A and fission track.

Introduction: The sample preparation process comprises six steps: starting with sample grinding, sieving and washing, density separation, magnetic separation, manual separation and finally assembling.

Materials: Joe crusher, 300µm, wave/sand waves (organic and inorganic), magnetic separator, Frantz Isodynamics, binocular magnification of 20 to 80X.

Crushing: This procedure is done ideally with a jaw crusher to try to do the least harm to the material under study. Sieving: The ideal particle size to be obtained is less than 300 µm to facilitate separation by density, so they must be sieved to obtain the desired size. Density Separation: This step can be performed by two methods, the use of trough (or Wilfley table) or the use of heavy liquids, both methods are not exclusive.

Magnetic Separation: Initially magnetic, terebrarite and other magnetic mineral using a common magnet is removed with a hand magnet and the Frantz Isodynamics.

Separation Manual: Manual separation is done with the aim of obtaining the best specimens, the most complete and best size crystals using high magnification to facilitate the work.

Grain assembly: With best mounting separate copies of grains will be further processed and analyzed according to the method to be used.

REFERENCES