STRIKE SLIP TECTONICS IN THE SOUTHERN NOCTIS LABERYNTHUS: GEOMORPHOLOGICAL AND STRUCTURAL FEATURES IN THE BOUNDARY WITH THE SIRYA PLANUM. M. Peña[1], S. Perroud[2,4], R. Quiroga[3], G. Fuentes[2,4]. [1]Universidad Mayor, Facultad de Ciencias, Escuela de Geología (matias.pena@umayor.cl), [2]Incaic Exploration SpA, [3]Tectonic group, IANIGLA-CONICET, Mendoza, [4]Escuela de Geología, Universidad Santo Tomás.

Introduction: The tectonic history of Mars has been a large subject of debate, acknowledging several structural features like normal, strike slip and, less common, compressional faults[1]. In the Tharsis province, the existence of all these structural features had pointed to a tectonic history from Late Noachian to Amazonian [1]. Here we use the new satelital data from MOLA in a specific area, to characterize structures and propose deformation chronology based on crosscut relationships. We recognized a series of geomorphological features, using MOLA imagenery, to test previous proposed structural lineaments, and describe new ones in the Noctis Labyrinthus area. In this work, we present a geomorphological analysis in the southern Noctis Labyrinthus, in the limit with the Syria Planum, that points to a NE-SW extensional direction.

Tectonic Setting: In the volcano-tectonic province of Tharsis, protracted growth had been proposed during the first quarter of Mars evolution and declining from 3 Gyrs ago[1]. In the area compending Noctis Labyrinthus and Fosae, extensional activity affecting Late Hesperian volcanic units had been proposed [1], with no compressional features recognized, and some strike-slip features in the northern limit of Noctis Labyrinthus [2].

Methodology: We integrated previous geological maps surrounding the Noctis Labyrinthus area and applied terrestrial tectonic geomorphology analysis techniques used in earth [3], and workflows using satellite-based 2nd DEM-derivatives such as slopeshades map, aspect map and systematic topographic profiles in order to search for active-like tectonic geomorphologies and classify them as extensional, compressional or strike-slip features.

Results and Discussions:

Our preliminary analysis of the southern sector of the Noctis Laberynthus showed cross-cut relationships of, apparent, WNW-trending strike-slip faults, with a dextral kinematic, that improves previous analysis[2], relating this dextral structures to the Late Hesperian-Amazonian deformation event [2]. Pull-apart geometries and echelon arrays can be seen in different sectors of the Noctis Labyrinthus [Figure 1]. And arrays that detach from the N-S extension direction associated in Valley Marineris, pointing those lateral and local structural settings control the tectonic of Noctis Laberynthus and the Sirya Planum.

Acknowledgments: We thank NASA PDS data for the use of the MOLA DEM. For additional information, please refer to http://bit.ly/HRSC_MOLA_Blend_v0.

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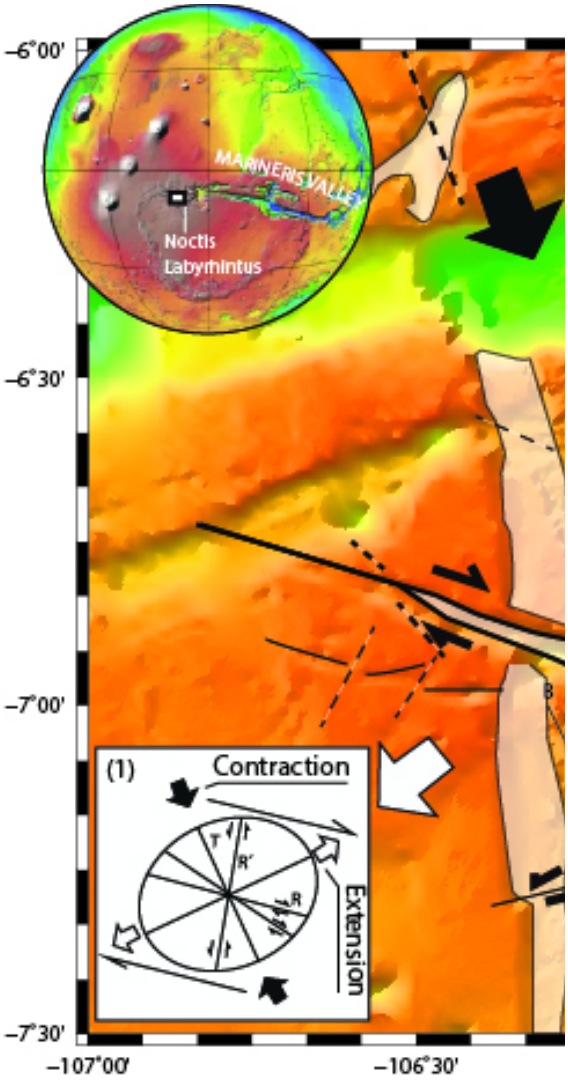

Figure 1: Structural interpretation of the South-Western portion of the Noctis Labyrinthus area, west of Marineris Valley. The main morphotectonic feature identified corresponds to a series of WNW-ESE lineaments delimiting an apparent sigmoidal-pull-apart-like depressions, probably associated with the dextral subhorizontal motion of a strike-slip fault system. The NE-SW conjugate system is poorly developed. Following a Readel shear zone model [4], the extensional direction estimated from these observations suggests a NE-SW direction, while an NW-SE contraction direction, explains the dextral kinematic motion from these structures. (1): Idealized model of Readel-type conjugated shear zones. Modified from [4] and [5].