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# Distribution of Present-Day Vertical Deformation of the Rif Domain (Morocco) From Continuous GPS data

Abdelali Fadil\*<sup>†1</sup>, Abdelilah Tahayt<sup>3,2</sup>, Philippe Vernant<sup>4</sup>, Robert Reilinger<sup>5</sup>, Taoufik Mourabit<sup>6</sup>, Mimoun Harnafi<sup>7</sup>, and Mohamed Amar<sup>8</sup>

<sup>1</sup>GEOHYD Lab, Geology Dept, Faculty of Sciences Semlalia, Cadi Ayyad University – Boulevard Prince My Abdellah B.P. 2390, 40000 Marrakech, Morocco

<sup>3</sup>Scientific Institute, Mohammed V University of Rabat, Morocco – Av. Ibn Batouta, B.P 703, 10106 Rabat, Maroc, Morocco

<sup>2</sup>Centre National pour la Recherche Scientifique et Technique, Rabat, Morocco (CNRST) – Angle Allal Al Fassi et Avenue des FAR, Hay Ryad, BP. 8027 10102 Rabat, Maroc, Morocco

<sup>4</sup>Géosciences Montpellier – Université Montpellier - CNRS – France

<sup>5</sup>Massachusetts Institute of Technology (MIT) – Cambridge, United States

<sup>6</sup>Faculty of Sciences and Techniques, Mohammed 1st University – Al Hoceima, Morocco

<sup>7</sup>Seismic Waves and Earth Structure research unit, Scientific Institute, Rabat - Morocco – Scientific Institute, Ibn Battouta Avenue POB 703, Morocco

<sup>8</sup>Agence Nationale de la Conservation Foncière, du Cadastre et de la Cartographie (ANCFCC) – Rabat, Morocco

## Abstract

The present-day horizontal movements in Morocco have been the subject of several studies using two decades of GPS measurements. These studies suggested models on the geodynamic processes in the western Mediterranean region. However, vertical movements, often of smaller magnitude, are still poorly constrained. In this work we use continuous GPS measurements from 2007 to 2017 to estimate both horizontal and vertical components of tectonic movements in the Rif's domain. The obtained GPS velocity field shows a very striking uplift about 4 mm/yr at the ISGN station located in the central Rif. This uplift is coupled by a subsidence rates of 1 ~ 2 mm/yr of the coastal stations (CEU1, TANG, TETN, HOCM, MELI) located around the Rif Mountains. These preliminary results disagree with geological estimates. On one side, the region between Tangier and Ceuta is supposed to be affected by a quaternary uplift; on the other, the external zone of the Rif (ISGN) shows a quaternary subsidence. *Keywords:* Vertical movements, GPS, Seismicity, Rif, Morocco.

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\*Speaker

†Corresponding author: a.fadil@uca.ma