**Title:** New GPS constraints on the kinematics of the southern Dead Sea Fault System

**Authors:** Gomez, F. ; Abu Rajab, J. ; Jaafar, R. ; Al-Tarazi, E. ; Ferry, M.

**Affiliation:** AA(Department of Geological Sciences, 101 Geology Bldg. University of Missouri, Columbia, MO 65211, United States fgomez@missouri.edu), AB(Faculty of Natural Sciences & Environment, The Hashemite University, Zarqa, 13115, Jordan jgahfar@yahoo.com), AC(Department of Geological Sciences, 101 Geology Bldg. University of Missouri, Columbia, MO 65211, United States rhj6w4@mizzou.edu), AD(Faculty of Natural Sciences & Environment, The Hashemite University, Zarqa, 13115, Jordan ealtarazi@yahoo.com), AE(Centro de Geofesica de Evora, University of Evora, Evora, 07002, Portugal matthieu@uevora.pt)

**Publication:** American Geophysical Union, Fall Meeting 2008, abstract #T41A-1938

**Publication Date:** 12/2008

**Origin:** AGU

**Keywords:** 1209 Tectonic deformation (6924), 1240 Satellite geodesy: results (6929, 7215, 7230, 7240), 8011 Kinematics of crustal and mantle deformation, 8107 Continental neotectonics (8002), 8111 Continental tectonics: strike-slip and transform

**Bibliographic Code:** 2008AGUFM.T41A1938G

## Abstract

The southern Dead Sea Fault System (DSFS) traces ~400 km from the Gulf of Aqaba in the south to the southern end of Lebanese Restraining Bend along the DSFS. The general structure involves two main segments, the Wadia Araba fault and the Jordan Valley fault, that control the Dead Sea pull-apart basin. This study assesses the present-day kinematics along the southern DSFS as expressed by present-day deformation. This study combines survey-mode (SGPS) and continuous GPS (CGPS) measurements from Jordan with other available GPS data to assess possible kinematic variations along the southern DSFS. The GPS network in Jordan consists of 15 SGPS sites that have been measured four times over a span of more than three years (2005 - 2008), along with two CGPS stations that have operated for more than 2 years. Preliminary velocities for SGPS sites yield uncertainties of approximately 1 mm/yr, and the CGPS sites yield uncertainties less than 0.8 mm/yr. Velocity patterns are generally consistent with locked faults accumulating strain. 1-D and 2-D Elastic dislocation models suggest slip rates of 3.8 - 4.6 mm/yr and 4.0 - 4.9 mm/yr for the Wadi Araba and Jordan Valley segments, respectively. These geodetically-based slip rates compare well with late Quaternary estimates based on faulted landforms. In addition to elastic models, the spatial coverage of GPS sites permits calculating velocity gradients and assessing infinitesimal strains and rotations along the fault, and within the Dead Sea pull-apart basin. Comparing the strain patterns with more detailed structural maps of the Dead Sea basin provides a means of assessing the kinematics involved in transferring displacement across a large releasing fault step. Furthermore, the rates of strain accumulation provide valuable constraints for assessing the earthquake hazard along the southern Dead Sea fault.

---

**Bibtex entry for this abstract** **Preferred format for this abstract**

(see Preferences )

Add this article to private library

Remove from private library

Submit corrections to this record

View record in ADS Bumblebee NEW!

**Find Similar Abstracts:**

Use:
- ☐ Authors
- ☑ Title
- ☑ Keywords (in text query field)
- ☑ Abstract Text

Return:
- ◉ Query Results
- ○ Query Form

Return 100 items starting with number 1

Database:
- ☐ Astronomy
- ☑ Physics
- ☐ arXiv e-prints

Send Query Reset