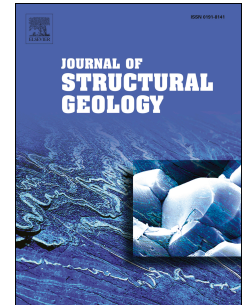


# Accepted Manuscript

Using incremental elongation and shearing to unravel the kinematics of a complex transpressional zone

P. Xypolias, N. Gerogiannis, V. Chatzaras, K. Papapavlou, S.C. Kruckenberg, E. Aravadinou, Z. Michels



PII: S0191-8141(18)30127-5

DOI: [10.1016/j.jsg.2018.07.004](https://doi.org/10.1016/j.jsg.2018.07.004)

Reference: SG 3699

To appear in: *Journal of Structural Geology*

Received Date: 2 March 2018

Revised Date: 10 July 2018

Accepted Date: 10 July 2018

Please cite this article as: Xypolias, P., Gerogiannis, N., Chatzaras, V., Papapavlou, K., Kruckenberg, S.C., Aravadinou, E., Michels, Z., Using incremental elongation and shearing to unravel the kinematics of a complex transpressional zone, *Journal of Structural Geology* (2018), doi: 10.1016/j.jsg.2018.07.004.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Using incremental elongation and shearing to unravel the kinematics of a complex transpressional zone

P. Xypolias<sup>a,\*</sup>, N. Gerogiannis<sup>a</sup>, V. Chatzaras<sup>b</sup>, K. Papapavlou<sup>c</sup>,  
S.C. Kruckenberg<sup>d</sup>, E. Aravadinou<sup>a</sup>, Z. Michels<sup>e</sup>

<sup>a</sup> Department of Geology, University of Patras, GR-26500, Patras, Greece

<sup>b</sup> School of Geosciences, The University of Sydney, NSW 2006, Sydney, Australia

<sup>c</sup> Geotop, Université du Québec à Montréal, H2X 3Y7, Montréal, Canada

<sup>d</sup> Department of Earth and Environmental Sciences, Boston College, Chestnut Hill, Massachusetts 02467, USA

<sup>e</sup> Department of Earth Sciences, University of Minnesota, Minnesota, USA

## ABSTRACT

This study presents in-depth geometric and kinematic analyses of a complex transpressional shear zone (Fellos Shear Zone, FSZ) that integrates structural mapping with microstructural and quartz crystallographic texture data. The FSZ strikes NE-SW and formed in the short limb of a map-scale antiform. The foliation pattern within the zone indicates dextral shearing whereas the macroscopic object lineation is dispersed over a half great-circle girdle along the mean mylonitic foliation. Based on this deformation pattern, the FSZ could be interpreted as a dextral, NE-directed triclinic transpressional zone. However, the integration of field-based with microtectonic data reveal a more complicate kinematic history. We show that the elongation trend is dispersed along an entire great-circle girdle when we take into account the trends of incremental elongations, recorded by fabrics with different strain memories. Mapping of incremental shear directions implies that the FSZ initiated as a NE-directed dextral transpressional shear zone, and progressively evolved into a NW-directed dextral zone. The passage from NE- to NW-directed shearing was accompanied by transpression whilst local transtension likely occurred during the last stages of ductile deformation. Deformation in the FSZ ended up, at semi-ductile conditions, with localized NE-directed dextral shearing. Our study demonstrates that the integration of field observations and fabrics/microstructures that have different strain memories is a powerful tool for unravelling the complex kinematics of high-strain zones.

**Keywords:** Ductile shear zone; object lineation; quartz fabrics; triclinic deformation; Cyclades

\* Corresponding author.

E-mail address: [p.xypolias@upatras.gr](mailto:p.xypolias@upatras.gr) (P. Xypolias)

Download English Version:

<https://daneshyari.com/en/article/8914334>

Download Persian Version:

<https://daneshyari.com/article/8914334>

[Daneshyari.com](https://daneshyari.com)