

## **HETEROGENEOUS DEFORMATION AT BULK AND LOCAL SCALES: CAN THEY BE EQUATED ?**

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Over the ensuing years, deformation kinematics inferred at the microscopic scale, from a few thin sections, has been equated to the bulk deformation. Implicitly and explicitly, this amounts to an assumption of a simple and unique relationship between the bulk and local deformation, finite and instantaneous deformation. Grain parameters measured by image analysis technique was used for the estimation of finite strain ( $R_f$ ), direction of finite elongation ( $\phi$ ) and sense of shear as measured from the Shape Preferred Orientation (SPO). It was observed that  $R_f$ ,  $\phi$  and sense of shear varies from one microdomain to an adjacent one. A microdomain showing dextral sense of shear may be neighboured by one showing sinistral shear sense. This observation implies that the natural deformation is inherently heterogeneous at the microscopic scale. Considering the heterogeneity of the natural deformation, it is argued that interpretation of bulk kinematics from  $R_f$ ,  $\phi$  and the sense of shear of a few microdomains is not only erroneous but also injudicious. In the light of these observations, we suggest that the estimations of  $R_f$ ,  $\phi$  and the ensuing interpretations are valid only for the particular homogeneous microdomain, during which the flow is assumed to be locally steady. Similarly kinematic analysis of the sense of shear is valid only within a homogeneous microdomain and a steady period of deformation.