

## Invariant Geodynamical Information in Geometric Geodetic Measurements

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We have carried out a theoretical analysis of invariant geodynamical information in geometric geodetic observations and concluded: (1) that relative displacements are not invariant quantities and thus cannot

uniquely be determined from the geodetic network without a tie to an external reference frame; (2) all the components of the strain tensors are not invariant and cannot individually be determined uniquely from the network. The theory is then applied to analyzing the Tokai first order triangulation/trilateration network spanning over more than 100 years. The invariant analysis of the Tokai network has shown that a belt near Shizuoka has been significantly deformed in the past 100 years, which has not been seen in any previous analysis of displacements and/or strains.