STOCHASTIC PROPERTIES OF DEFORMATION CHARACTERISTICS OBTAINED FROM GPS SITE VELOCITIES

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Station velocities resulting from permanent or epoch GPS observations could be transformed to the parameters of surface deformations under the assumption that the examined territory is a continuous environment. The input geometric information consists of irregularly distributed site velocities expressed in geocentric Cartesian coordinate system. Such velocity field is submitted to six subsequent linear transformations finally leading to the regularly distributed fields of surface dilatation and linear elongation. We are examined the error propagation of the procedure mentioned above, starting with full variance-covariance matrix of site velocities. The stochastic properties of individual transformation steps (transformation to horizontal coordinate system, linear interpolation of velocity vectors, computation of components of surface deformation tensor and expressing the surface dilatation and linear elongation) are discussed and visualized. We demonstrate this stochastic approach on the CERGOP velocity field derived from six epoch campaigns performed from 1994 to 2001. The significance of derived deformation characteristics is discussed and the further improvements of surface dilatation modeling are outlined.