A block-fault model for deformation of Kanto and Izu district derived from GPS and leveling data

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We constructed a fault-block model to explain the interseismic deformation observed by continuous GPS (GEONET) and leveling in Kanto and Izu district, central Japan. The modeled region ranges in N33-37 degree and E138-141 degree, approximately. We used three components of site velocities at the GEONET stations from late 1997 to early 2000 and vertical velocities at benchmarks which were surveyed by leveling more than twice in 1990"s. The displacement rate on surface was modeled as a sum of rigid motion of crustal blocks and deformation due to slip deficits of rectangular faults. We approximated geometry of crustal blocks" boundary by rectangular faults and fixed location, strike, and dip of the faults. Rake angles of slip deficit were calculated with relative Euler vectors between two crustal blocks sandwiched the fault. Therefore, unknown parameters of our block fault model are Euler vectors of crustal blocks and rate of slip deficits.

Preliminary results show rate of slip deficit around Sagami Trough is 2 cm/yr southwest of Miura Peninsula, 3-5 cm/yr southeast of Boso Peninsula. At least, four crustal block (e.g. Pacific plate, Philippine Sea plate, Izu microplate, and central Japan block) is necessary to fit the observed velocity reasonably. Our crustal block model predicts the observed data very well in Kanto district because residuals of horizontal velocities are less than 2 mm/yr at the most GPS stations in Kanto.