Time-dependent model for volume changes in pressure sources of swarm activities east off Izu peninsula using geodetic data

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A time-dependent model for volume changes in pressure sources of seismic activities east off Izu peninsula is developed from precise leveling, EDM, GPS, and tidal data during 1973-1998. Murakami (2006) proposed the sill-like opening crack beneath the east area of Izu peninsula based on the leveling data. We re-estimated the optimal source parameters of opening crack from leveling data and GPS data observed before the swarm period by a genetic algorithm (GA). The opening crack was estimated the length of 12 km at the depth of 13 km beneath the east area of Izu peninsula. Dip angle is 40 degree.

I assumed the geometry of shallow opening crack in the swarm area using the hypocenter distribution detected by Hayashi and Morita (2003). The volume changes in the two opening cracks are calculated using the Akaike's Bayesian information criterion (ABIC) for the period from 1902 to 2005.

During the period from 1974 to 1990, a large inflation was estimated in the deep crack. The opening of deep crack was stagnant in the period from 1990 to 1995. After 1995, a deflation continued until 1998.