SVC050-P05   Room:Convention Hall   Time:May 23 16:15-18:45

MaGCAP-V (4) -Upgrade for gravity data and shperoidal model

Keiichi Fukui[1*], Shinobu Ando[1], Takayuki Sakai[2], Akimichi Takagi[3], Shin'ya Onizawa[1], Toshiki Shimbori[1], Hitoshi Yamasato[2], Hiroshi Ohsuga[4]

[1]Meteorological Research Institute, [2]Volcanology section, JMA, [3]MEXT, [4]VisCore Corp.

We developed the software MaGCAP-V (Magnetic and Geodetic data Computer Analysis Program for Volcano) to evaluate the magmatic activity from ground deformation data and geomagnetic changes observed at volcano. MaGCAP-V can handles both geodetic and geomagnetic data, and can do modeling the source of change through trial and error or inversion method by using GUI on Windows PC (Churei *et al.*, 2002; Fukui *et al.*, 2005).

MaGCAP-V Version 1.1 (released in 2005) handles the following data, 1) GPS (X,Y, Z, latitude, longitude, and ellipsoid high), 2) displacement (also leveling data), 3) tilt, 4) magnetic total intensity, 5) atmospheric pressure, temperature, humidity, precipitation, and 6) hypocenter. DEM data (GSI DEM or user's DEM) are used for the modeling and drawing the topography. And also users can use the vector data to display the lakeshore and fault, etc.

It is possible that plot data in any combination of observation items as time series graph and as map graph. Map graph plots marks and vectors on observation points, or draws as color map created from interpolated grid data. GPS and displacement data in map graph create from a difference between two-period or displacement speed calculated from data within the designated period. The effect of the regional stress field can be removed from GPS and displacement data.

The following models are used, 1) Mogi model, dislocation model, and composite source for ground deformation, 2) thermal demagnetization model for sphere, column, conical, box, and composite source, 3) piezo magnetism which makes the multiple Mogi models. In order to reduce the effect of topography, we use a simple mode such as the modified Mogi model (Fukui *et al.*, 2003). And modelings of volcano deformation by using a FEM simulation database (Fukui *et al.*, 2006) are used to remove the effect of topography, heterogeneity structure and the shape of source.

MaGCAP-V was upgraded for the application to electro-optical distance measurement (EDM) data, interferometric SAR (In-SAR) data and analysis of dynamic process in 2009, and was upgraded for gravitmetric data.and spheroidal model (Sakai *et al.*, 2008), and improvedt of performance through programming for maluti-threading CPU and double buffer in 2010..

Keywords: software, volcano monitoring, gravity, GPS, InSAR, EDM