Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

MIS29-07 Room:101A Time:May 22 11:00-11:15

Toward Construction of iES Database (Database for Information on Electromagnetic Surveys) for Conductivity Structure ben

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The Japan Arc, where many large earthquakes and volcanic eruptions have occurred, is formed by the Philippine Sea and Pacific plates subducting beneath the Eurasian and North American plates. Moreover, these two different aged plates are subducting with overlapped geometry in the central part of Japan. Therefore, subsurface structure beneath the Japan Arc up to deeper part is highly three-dimensional. Recently, three-dimensional seismic velocity structure models beneath the Japan Arc have been presented, and displacement fields are monitored in real time with the Japanese Archipelago scale using very high density GPS observation network (GEONET). Electrical conductivity provides us very important physical quantity suggesting condition beneath the Japan Arc, which is independent from density, seismic velocity, etc. Therefore, construction of a three-dimensional conductivity model beneath the whole Japan Arc is very important issue in geosciences, because conductivity models give constraint to the thermal structure and/or fluid distribution in the crust and mantle of the earth. In order to achieve the scientific goal, we made a research plan composed of the following three phases;

Phase I: We collect all information on electromagnetic surveys, which were carried out in and around Japan, among scientific community in Japan to form the iES Database (Database for Information on Electromagnetic Surveys). Then, we will chose suitable data sets among the iES Database to construct the database of observed electromagnetic data at 50km interval mesh covering the whole Japan Arc (50km Interval Mesh Database), which will be used for construction of 3D conductivity structure model beneath the Japan Arc at the final phase (Phase III).

Phase II: In addition to the data set chosen from the iES Database in Phase I, new observations will be made to infill gap regions over the Japan Arc to obtain full set of data covering the whole Japan Arc.

Phase III: A three-dimensional conductivity model beneath the Japan Arc will be inverted based on data set in the 50km Interval Mesh Database.

The overall research plan from Phase I to Phase III above is called JEMINI (Japan Electro-Magnetic Imaging with Network observation In-depth) project. In our presentation, we will introduce the details of Phase I in the JEMINI project, especially about the iES Database, which is the main component in Phase I.

Keywords: resistivity structure, conductivity structure, geo-electromagnetic survey, database