

Development of database system for integrating various models of seismic velocity structure and geometry of the subducting plate around Japan

Development of database system for integrating various models of seismic velocity structure and geometry of the subducting plate around Japan

\*山岸 保子<sup>1</sup>、仲西 理子<sup>2</sup>、三浦 誠一<sup>2</sup>、小平 秀一<sup>2</sup>、阪口 秀<sup>1</sup>

\*Yasuko Yamagishi<sup>1</sup>, Ayako Nakanishi<sup>2</sup>, Seiichi Miura<sup>2</sup>, Shuichi Kodaira<sup>2</sup>, Hide Sakaguchi<sup>1</sup>

1.国立研究開発法人海洋研究開発機構 数理科学・先端技術研究分野、2.国立研究開発法人海洋研究開発機構 地震津波海域観測研究開発センター

1.MAT, JAMSTEC, 2.CEAT, JAMSTEC

To estimate strong motions caused by earthquakes that could occur in Japan in future and predict seismic hazards, it is necessary to create an accurate model of geometry of the subducting plate and seismic velocity structure, particularly obtained by offshore seismic survey and observations. Most of various kinds of seismic velocity structure models including plate boundary around Japan are presented. However, they are managed individually by each organization constructing the model. To create a new and accurate model of geometry of the subducting plate and seismic velocity structure model, first we need to integrate existing models and clarify the spatial distribution of models regardless of their kinds. Here we have developed database system to store the data of various kinds of velocity structure and plate geometry around Japan. In this database system, various seismic structure models are stored as data, which are three-dimensional (3D) seismic velocity models obtained by seismic tomography, plate geometry, 2D seismic velocity structure models, 2D plate geometry obtained by offshore seismic survey, and hypocenter distribution determined by offshore observation and JMA. Using this database system, users can obtain several structure models at once. This database system can provide not only original data of models but also equal interval grid data, and KML data. The equal interval grid data is output as the text file and have the same scale for all kinds of models, which are produced by bicubic-interpolation of original data. On GUI of the database system, users can know what kind of models and hypocenter distribution exist around the Japanese Islands graphically, and obtain the data of different kinds of models existing in the rectangle region specified by users. The region is specified by setting a profile and the distance from the profile in the map on GUI. The equal interval grid data of 3D seismic velocity model is prepared for the vertical cross section cut by the profile specified by user, which show the distribution of seismic velocity or velocity perturbation. The equal interval grid data of plate geometry are created for the region specified by user. The equal interval grid data of 2D seismic velocity structure model and 2D plate geometry model are created from all data of the models crossing the region and selected by user. Using KML files provided by the database, the data of different kinds of models are visualized in Google Earth at once. Therefore this database system with Google Earth will enable us to create a new accurate model of geometry of the subducting plate and seismic velocity structure around Japan. Acknowledgement: This study is carried out as 'Research project for Development of seismological information database for modeling seismic velocity structure offshore around Japan' funded by MEXT, Japan. We are grateful to all who have kindly agreed to the incorporation of their model and data into our system. The earthquake catalog used in this study is produced by the Japan Meteorological Agency, in cooperation with the Ministry of Education, Culture, Sports, Science and Technology. The catalog is based on seismic data provided by the National Research Institute for Earth Science and Disaster Prevention, the Japan Meteorological Agency, Hokkaido University, Hirosaki University, Tohoku University, the University of Tokyo, Nagoya University, Kyoto University, Kochi University, Kyushu University,

Kagoshima University, the National Institute of Advanced Industrial Science and Technology, the Geographical Survey Institute, Tokyo Metropolis, Shizuoka Prefecture, Hot Springs Research Institute of Kanagawa Prefecture, Yokohama City, and Japan Agency for Marine-Earth Science and Technology. We are grateful to Zhu Riming, Co. Ltd. VisCore, for his skill to develop this database system and data conversion system from the original data to KML.