

The estimation of the neutrino flux from the crust of the Japanese islands using the geochemical database

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Geoneutrino observed at the anti-neutrino observatory "KamLAND" at Kamioka allows us to obtain information on the amount and distribution of radiogenic elements (uranium and thorium) in the deep mantle and crust. It is necessary to divide the contribution from Japanese from the observed neutrino flux on closely to precisely estimate the quantity of U, Th of the earth deep earth because such radiogenic elements exhibit high concentration in the crust. Previous estimation of the crust origin geoneutrino was estimated based on the relatively simple chemical assumption on the compositional variation and spatial distribution. However, the radioactive elements of the Japanese crustal rock are distributed with very wide compositional range with complex spatial distribution. Therefore, it is necessary to estimate spatial distribution of radioactive element in the Japanese crust for the precisely measurement of geoneutrino from Japanese crust. In addition, petrological and geochemical structure of the Japanese crust of are fundamental information for understanding seismic activity, volcanic activity and tectonism. The analysis of the spatial variation of the chemical composition of the Japanese Islands crust is important in discussing about the evolution history of the Japanese Islands and the chemical evolution in the subduction zone.

In this study, we utilize DODAI to improve the estimation error of geoneutrino from the Japanese crust (Takeuchi et al., 2019). We published the database "DODAI" which compiled geochemical data published by the Japanese domestic journals and bulletins in the journal of the Geological Society of Japan (Haraguchi et al., 2018). This database incorporates the precise sampling position of individual geochemical data using an electronic map. Resolution of the positional information were improved drastically.

The "DODAI" database covers whole area of Japanese Islands with highly precise positional information is useful for data analysis and modeling. The geochemistry database with highly precise positional information is useful for modeling of the geochemical structure of the solid earth. In this study, we present the potential of the DODAI database and geoneutrion in the analysis of the geochemical structures of Japanese crust, as well as the deep earth.

Keywords: neutrino, geochemical database, geochemical structure of crust and mantle