

Development of 4D Earthquake Visualizer - To deepen the understanding of Kumamoto Earthquake -

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Japan is a country located at the plate convergence zone with frequent earthquakes. As even after 3.11 Higashi-Nihon earthquake in 2011, several M6-class earthquakes such as Kumamoto, Tottori and recently Fukushima have occurred in and around Japan, seismology has been the study field of broad interest.

Since earthquake is a phenomenon caused by the slip with fracture along the underground fault plane, it is desirable to understand the fault plane in three dimension. Although for the past several decades mass media have expressed epicenters with single "X" marks, fault planes of earthquakes actually have finite area. While the fault plane of the 3.11 earthquake, for instance, is estimated to be ~100,000 km² (~500 km north-south and ~200 km east-west), the media reported as if one "X" mark near Sendai was the point where the event took place. Further, it is also important to understand the dip angle of the underground fault plane since the focal mechanism of an earthquake affects the seismic intensity of the affected area.

In this way, strong needs were recognized for the comprehensible visualization of information on earthquakes and touch UI to intuitively understand earthquakes in both the research and media front. It has been difficult to grasp the underground fault planes in three dimension due to their invisibility caused by technological immaturity of hardware and software. For this purpose, expensive, download-to-local specialized software has required sophisticated software/coding skills.

In order to solve these issues, LIVEARTH, Inc., the startup with cutting-the-edge visualization technology partnered with Kawai Group of Global Seismology Laboratory. Our joint research resulted in the development of innovative 4D earthquake visualization "shingen". Thanks to progress of digital hardware and software infrastructure such as faster chipsets and 3D data processing library, "shingen" makes it possible to more accurately understand and estimate the underground fault planes.

Now, LIVEARTH and Kawai Group have been closely working with academia and mass media to prepare solutions to better understand and communicate earthquake visualization to the public.

In practice, we used "shingen" in earth and planetary science class of the University of Tokyo on July 4/5th, 2016, and received various well-thought-out research reports from students.

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