3D seismicity maps for ChromaDepth 3D Glasses employing the Generic Mapping Tools

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A decade ago, we developed a prototype of three dimensional seismicity maps using 'Chroma Depth by 3-D glasses(Chroma tec Inc.)' for educational tools(Okamoto,1998). This year, we improved the making process of these maps by employing general tools, 'the Generic Mapping Tools(Wessel and Smith,1988)' on Linux, instead of our old method using a limited system on a Japanese domestic PC.

The hypo-center data which are brought from JMA and USGS are renewal and doubled, moreover the hypo data are sorted by depths in order to gain more real perspective. Therefore the maps become more colorful and precise. The maps include Japanese each region, famous subduction zone around the world. And this time maps of Tyuetsu earthquake area, Kyusyu region and California area are added. The general feature of these maps is as follows,

The mechanism of Chroma Depth 3D Glasses is composed of two built in micro-prisms with inverse order, so their three dimensional effect is caused with different diffractions of colors. Therefore we should only plot the hypo-centers using color codes dependind on their depths in a black background, while the other methods such as blue-red stereo pairs, polaroid pairs etc., have to prepare two duplicated maps drawing from slightly different viewpoints. This process is made quite easy rather than previous methods. Also, no special training is needed for watching maps, differs from the other methods, and the cost for this map is quite low, 1 US$ for each ChromaDepth glasses and for printing a A3 photo-printing paper using an ink jet printer.

Moreover, the three dimensional perspective feeling is amazing not only for children but also for adults, so these maps are quite useful both for educational and outreach purposes. Especially, these maps reveal the seismic structure beneath the ground and also give us a deep impression by marvelous displays of the fault lineations or a plate boundary so called 'The Wadati-Benioff zone'.

The amazing perspective effect can be got not only by printed maps but also on computer displays. Of course the precise detail of the three dimensional effects is slightly lower than by previous traditional methods. However its amazing perspective is quite enough for educational purpose and moreover the mechanism of these glasses can play an important role on optics study by their fantastic effects.

The scripts and the products will be soon available on our website as a public domain. The user can use these tools freely and tune up the parameters for their own purposes.