Geophysical Research Abstracts
Vol. 16, EGU2014-10663, 2014
EGU General Assembly 2014

The pyPHaz software, an interactive tool to analyze and visualize results from probabilistic hazard assessments

Roberto Tonini (1), Jacopo Selva (2), Antonio Costa (2), and Laura Sandri (2)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Roma 1, Roma, Italy (roberto.tonini@ingv.it), (2) Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Bologna, Bologna, Italy

Probabilistic Hazard Assessment (PHA) is becoming an essential tool for risk mitigation policies, since it allows to quantify the hazard due to hazardous phenomena and, differently from the deterministic approach, it accounts for both aleatory and epistemic uncertainties. On the other hand, one of the main disadvantages of PHA methods is that their results are not easy to understand and interpret by people who are not specialist in probabilistic tools. For scientists, this leads to the issue of providing tools that can be easily used and understood by decision makers (i.e. risk managers or local authorities).

The work here presented fits into the problem of simplifying the transfer between scientific knowledge and land protection policies, by providing an interface between scientists, who produce PHA's results, and decision makers, who use PHA's results for risk analyses. In this framework we present pyPHaz, an open tool developed and designed to visualize and analyze PHA results due to one or more phenomena affecting a specific area of interest. The software implementation has been fully developed with the free and open-source Python programming language and some featured Python-based libraries and modules. The pyPHaz tool allows to visualize the Hazard Curves (HC) calculated in a selected target area together with different levels of uncertainty (mean and percentiles) on maps that can be interactively created and modified by the user, thanks to a dedicated Graphical User Interface (GUI). Moreover, the tool can be used to compare the results of different PHA models and to merge them, by creating ensemble models.

The pyPHaz software has been designed with the features of storing and accessing all the data through a MySQL database and of being able to read as input the XML-based standard file formats defined in the frame of GEM (Global Earthquake Model). This format model is easy to extend also to any other kind of hazard, as it will be shown in the applications here used as examples of the pyPHaz potentialities, that are focused on a Probabilistic Volcanic Hazard Assessment (PVHA) for tephra dispersal and fallout applied to the municipality of Naples.