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BET_VH: a new software code for long-term Probabilistic Volcanic Hazard Assessment

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BET_VH (Bayesian Event Tree for Volcanic Hazard) is a new software package assessing long-term probabilities of different hazardous phenomena produced by volcanic eruptions, and their impact on surrounding territory. In particular, BET_VH is able to compute the probability of occurrence of a specific phenomenon, and the probability that the consequent products of such phenomenon will reach a particular area overcoming a selected threshold. This can be made for a given scenario (an eruption with a specific vent location and size) or for a weighted combination of different possible scenarios. The user of the code can handle any possible volcanic threats, such as tephra fall, lava flows, pyroclastic flows, lahars, etc. Besides probability estimations, the code provides also a formal estimation of the associated uncertainties that account for the quality of prior information (for instance, numerical models, expert opinions, etc...), and the number of past data available, through Bayesian inference. The code requires in input any kind of relevant information available, ranging from numerical models, field observations, expert opinion, eruption catalog, and so on. The output consists of a set of probability maps in JPG, and GoogleEarth format (with uncertainty), that cover a vast range of possible end-user demands. A tutorial example from Campi Flegrei will be presented.