



Sequence of the Vesuvio eruptive events recorded in shallow-water Ionian Sea sediments

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Our group has been studying for many years shallow-water sediment cores drilled from the Gallipoli Terrace (Ionian Sea). Accurate core dating is the basis for the study of the climatic time series measured in these cores, which allow reconstructing past climatic natural variability and, consequently, also evaluating its contribution to the modern temperature increase. The absolute dating of the cores was obtained by measuring the “number density” of pyroxene grains, witnesses of the Vesuvio eruptions, for which historical documentation is available starting from the Pompei eruption (79 A.D.). Historical documents are quite detailed back to 1638 and rather sparse before that date. Using the results of radiometric dating applied to the upper part of the core, the peaks corresponding to 22 historical events occurred in the last two millennia were identified along the cores. The sedimentation rate of the Gallipoli Terrace was thus found to be constant in the last two millennia (0.0645 ± 0.0002 cm/year) and uniform over the whole area. An automatic statistical methodology to extract pulse-like events has now been successfully applied to the pyroxenes series of the shallow-water core GT89-3. This procedure recognizes with high posterior probability all the post-1638 volcanic peaks in the pyroxenes series, corresponding to the events we originally used to determine the sedimentation rate given above. The majority of the events ante-1638 is also recognized, thus confirming the validity of the dating obtained for the Gallipoli Terrace. Moreover, a few more possible ante-1638 eruptions are singled out. The series has also been spectrally analyzed by three independent methods and significant oscillations with periods of about 400 y, 13.8 y, 9.3 y and 8.4 y, together with a trend, have been identified.