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The subsurface geology of Rome: sedimentary processes, sea-level changes and astronomical forcing

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Abstract

In this paper we present a reconstruction of the stratigraphic setting of the continental sedimentary sequences that were deposited by the Paleo-Tiber River within the greater area of Rome between 0.9 and 0.6 Ma, carried out through analyses of a large number of borehole data. Through palinspastic restoration of several cross sections we depict the original geometry of the sedimentary record that has been dislocated by intense tectonic activity linked to volcanism, and we reconstruct the geologic and paleogeographic evolution of this area.

Moreover, we provide a complete review of the chronostratigraphic and magnetostratigraphic data reported in previous work, and we extend paleomagnetic analyses to three new clay sections. These geochronological constraints allow us to compare aggradation of the Paleo-Tiber sedimentary successions with the $d^{18}O$ record, evidencing a strict link between sedimentation and sea-level changes in the Rome area. By doing so, we provide a direct test on the timing of the sea-level rise for MIS 19 through MIS 15: a record of data for which no equivalent exists in the literature.

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