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THE 2002 MOLISE EARTHQUAKE SEQUENCE: RELATIONSHIP BETWEEN DAMAGES AND SEISMIC PROPAGATION IN RIPABOTTONI (CB)

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On October 31st, 2002 and on November 1st, 2002 two moderate size earthquakes (Ml = 5.4 at 11.32 local time and Ml = 5.3 at 16.08 local time) occurred in Molise region, Southern Italy. Ripabottoni (CB), is one of the towns that suffered major damages.

The observation of the damage caused by the earthquake to the monumental heritage has confirmed, yet again, how churches represent a typology of building which is particularly vulnerable to seismic actions. Moreover, we noticed how, in many cases, the intrinsic vulnerability was increased as a result of the recent retrofitting intervention, incompatible with the original behaviour of the construction. Roofs remade in r.c. or in steel, the insertion of very thick r.c. tie-beams, the creation of r.c. floors, have led, as partly already observed after the 1997 Umbria-Marches earthquake, to an increase both in the force of the seismic shocks (as a consequence of the greater weight) and in deformations incompatible with the natural vibration-mode of the masonry walls.

An emblematic case is that of the churches of Ripabottoni, S. Croce di Magliana and S. Giuliano di Puglia, which have demonstrated damage mechanisms connected with the cracking and collapse of the vaults (owing to their limited thickness and the lack of tie rods) and with the crushing and shearing of the masonry pillars in the churches with more than one nave.

Besides, in order to analyse damage effects a temporary seismic/accelerometric local network was installed.

The comparison of collected data with surface geology indicates the presence of important local effects. In particular the evaluation of the strong motion records, in

Ripabottoni, has allowed a first interpretation of the crushing mechanisms of many masonry pillars