

Roman mausoleum tested for ancient earthquake damage

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Built under a sheer cliff, with a commanding view of the forum and castle in the ancient city of Pinara in Turkey, a Roman mausoleum has been knocked off-kilter, its massive building blocks shifted and part of its pediment collapsed. The likely cause is an earthquake, according to a new detailed model by Klaus-G. Hinzen and colleagues at the University of Cologne. They conclude that a 6.3 magnitude earthquake could have caused the damage, and their new finding gives seismologists a new data point to consider when they calculate the likely earthquake hazards for this southwestern region of Turkey.

Researchers have seen other signs of strong [seismic activity](#) in Pinara, most notably a raised edge to the ancient town's Roman theater that appears to be due to activity along a fault. But archaeologists and seismologists were not certain how the mausoleum sustained its damage. An earthquake seemed likely, but the mausoleum is also built under a cliff honeycombed with numerous other tombs, and damage from a [rockfall](#) seemed possible.

Hinzen and colleagues mapped the position of each part of the mausoleum using laser scans, and transferred 90 million data points collected from the scans into a 3-D computer model of the tomb. They then ran several damage simulations on the 3-D model, concluding that rockfall was not a likely cause of damage, but that an earthquake with magnitude 6.3 would be sufficient to produce the observed damage pattern to the mausoleum's heavy [stone blocks](#).

More information: "Quantitative Archeoseismological Study of a Roman Mausoleum in Pinara (Turkey) – Testing Seismogenic and Rockfall Damage Scenarios," by Klaus-G. Hinzen et al. *Bulletin of the Seismological Society of America* , 2013.

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