

# IGT-Kolloquium

12. Mai 2016

## **Lessons from the 2014 moderate-magnitude earthquakes in Cephalonia, Greece**

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Two earthquake events, both of magnitude 6.1, took place in January and February 2014 in the island of Cephalonia. Despite their moderate magnitude, the two events produced very strong acceleration records, numerous (small scale) landslides, liquefaction and lateral displacements of the Lixouri harbor quay-wall, and destruction of monuments. The presentation will outline this damage, and will discuss the significance of the records vis-a-vis the cemetery damage, where the majority of tombstones and monuments toppled and/or were severely displaced and rotated. Seismological, geological and strong-motion analysis reveals the forward-rupture directivity as a dominant phenomenon of the February event. The response spectra of the directivity-affected component of motion is compared with some of the most destructive records from the Kobe (1995) and Northridge (1994) earthquakes. 2D and 3D analyses of the rocking-sliding response of specific monuments confirm the similar destructiveness of the recorded motion. The large lateral displacements of the harbor caissons are one more consequence of this motion. By contrast, another important outcome of the two earthquakes was that the buildings of the stricken region performed very satisfactorily, to the point that there were no casualties. Two causes for such a surprising success are identified and will be discussed.