

SEMINARI



UNIVERSITÀ DEGLI STUDI
DI TRENTO
Dipartimento di Fisica

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Room A109 – Polo Ferrari 1

The Mediterranean as an Earth-Scale Geophysical Sensor: Polarization Sensing on Subsea Fiber Infrastructure

Abstract:

By tracking the polarization rotation vector in submarine optical cables carrying live traffic across the Mediterranean Sea, we unambiguously detected the signature of the recent Mw 8.8 Kamchatka earthquake in two independent optical links in the Mediterranean Sea. Moreover, distinct precursors of the earthquake were observed in multiple cables within the same region. Their distance of roughly 9,000 km from the epicenter unequivocally indicates that the earthquake preparation was governed by Earth-scale processes, whose nature remains unknown. We conjecture that the excitation of Earth's normal modes by solid tides may explain this global-scale behavior.

These results demonstrate the potential of submarine optical fiber links as highly sensitive geophysical observatories, opening new perspectives for understanding earthquake dynamics and developing future early warning systems.

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