

SESSION 07- Old Waves, New Tools: Reviving Analog Seismograms and Legacy Seismic Data in the Digital Age

Conveners

Raphael De Plaen, Royal Observatory of Belgium (raphael.deplaen@seismology.be)

Ryan Gallacher, International Seismological Centre (ryan@isc.ac.uk)

Silvia Scolaro, Università degli Studi di Messina (silvia.scolaro@unime.it)

Josep Batlló, Institut Cartogràfic i Geològic de Catalunya (Josep.Batllo@icgc.cat)

Session Description

Seismology continues to evolve along with advances in digital signal processing, instrumentation, big data analysis, and machine learning. These advances have greatly enhanced seismic analysis in the recent decades of digital seismic recordings. However, a vast archive of analog data, captured on inked, smoked, or photographic paper, as well as on film and magnetic tape, remains only partially explored.

In recent years, increasing efforts have been dedicated to the preservation, digitization, and vectorization of historical seismograms, aiming to rescue invaluable records before their physical media degrade beyond recovery. These initiatives have also spurred community-wide progress in adopting FAIR principles and developing standardized workflows to make legacy data accessible and reusable.

The integration of these digitized records into modern analyses opens new opportunities: reexamining past earthquakes and other natural or anthropogenic sources, extending observational time windows by decades or even centuries, and enabling the study of long-term temporal variations in solid Earth processes.

This session invites contributions on all aspects of the preservation, digitization, and use of legacy seismic data, including techniques for mass digitization, automated recognition, and conversion of analog traces into digital numerical arrays, as well as case studies. We particularly welcome studies that integrate AI, image processing, and data management innovations into the analysis of historical seismic data, bridging early instrumental observations with contemporary data science.

