



From Aki's ACH to high-resolution teleseismic tomography: the Vrancea example

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Since Keiiti Aki published the ACH method in 1977, teleseismic tomography became one of the key techniques for seismologists to investigate the earth's upper mantle velocity structure. Nowadays high-resolution snapshots of the present day status as the result of tomographic imaging are fundamental to establish, test and to revise geodynamic models. In general during the first days of ACH results were open for various interpretations. The distant and irregular station spacing due to the small number of permanent and mobile seismic sensors, mostly operating with analogue data recorders, the inaccurate raytracing and the linear approach itself prevented high model improvements during inversion.

The Vrancea region in SE-Romania with its peculiar intermediate depth seismicity can be taken as an ideal example to demonstrate the developments in teleseismic tomography since these early days of ACH. Several teleseismic tomographic inversions were carried out for the region from various authors and with different datasets. Each of them 'samples' a characteristic time frame when significant improvements in data quality and/or methodology justified a new step towards better results. Latest high-resolution tomographic imaging, but still enrooted on Aki's pioneering work, allows a detailed look at the final stage of lithospheric detachment accompanied by strong seismic activity and representing an exclusive criterion for existing geodynamic models.