



# Supplementary material: The historical seismogram collection in Strasbourg

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## Instrumental responses

This supplement presents the complete set of available instrumental responses for the Strasbourg seismological station. The main source is the collection of station books. For most of the instruments, the figures contain both instrumental constants as well as the corresponding displacement responses given in terms of amplitude and phase.<sup>1</sup> The curves are color coded indicating the date of the calibration.

Very few information is available for the Peterschmitt seismograph (CPP) and the Press-Ewing instruments. Concerning the CPP, a set of instrumental constants is available in Charlier and van Gils [1953]. We also have a magnification curve (dated from January 1956) that we fit using a grid search for the periods and the damping constants for the seismometer and the galvanometer ( $T_s$ ,  $T_g$ ,  $h_s$ ,  $h_g$ ) and considering no coupling between the seismometer and the galvanometer.<sup>2</sup> The obtained values as well as

those from Charlier and van Gils [1953] are given in Table S1, and Figure S6 presents the corresponding displacement responses.

For the Press-Ewing seismographs, the information available is limited to a magnification curve that we fit using a grid search for  $h_s$ ,  $h_g$  (fixing  $T_s$  and  $T_g$  to the nominal values (30 s, 90 s)) and considering no coupling between the seismograph and the galvanometer. The Figure S7 presents the obtained value and the corresponding displacement responses. This response is supposed to be valid for the 3 components. Calibration pulses are also available on some seismograms. In January 1976, the photographic recording system was replaced by an ink one, thus the instrumental response was modified. Although we have no details of the new response, there are regular calibration pulses in the seismograms and the analysis of some of them suggests a flat velocity response between 5 and 100 s approximately.

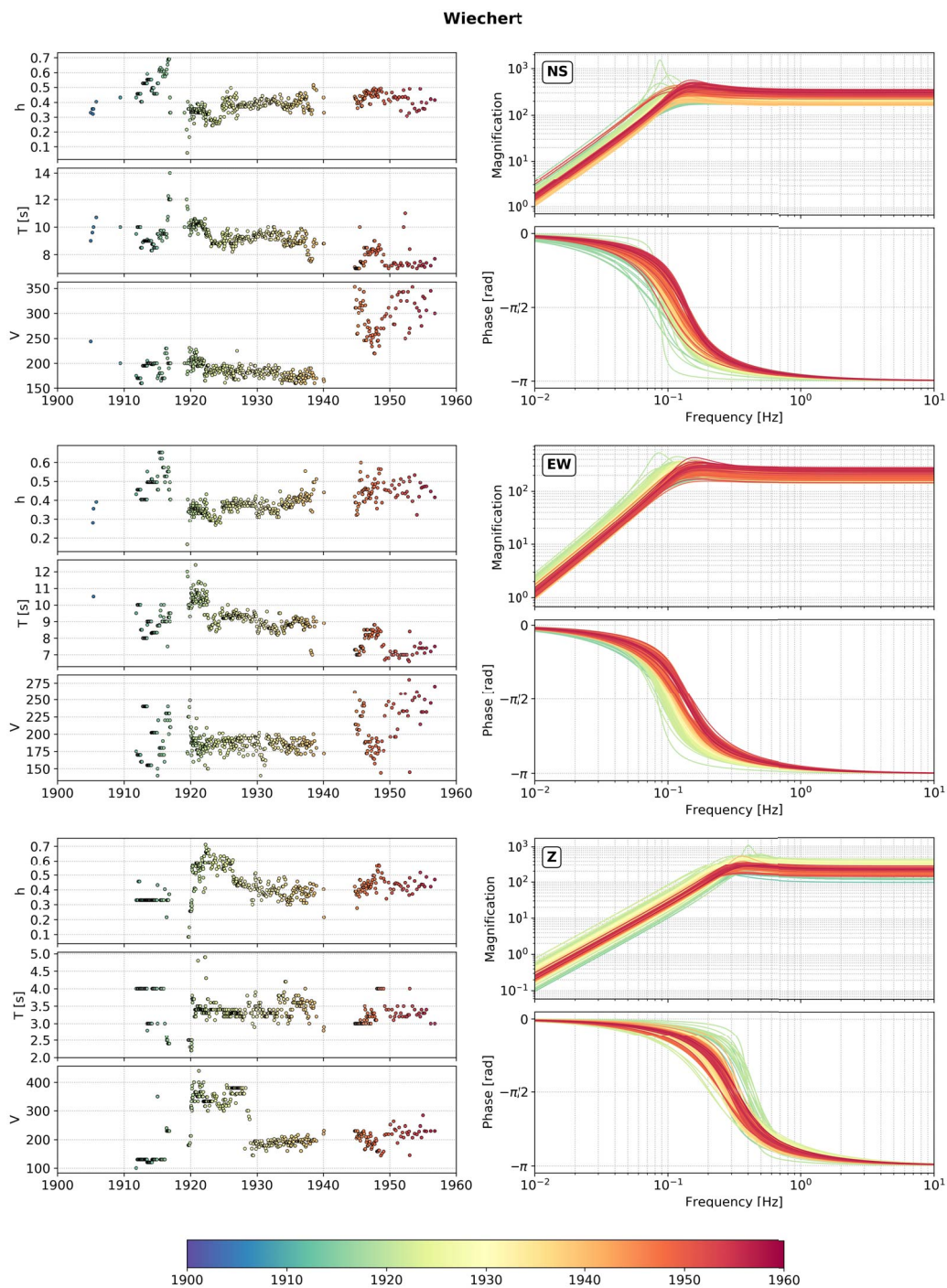
**Supplementary Table S1.** Instrumental constants of the Peterschmitt seismograph (CPP) in the Strasbourg station

Date	$T_s$	$T_g$	$h_s$	$h_g$	$Vm$
1953	1.4	1.2	1	1	4400
1956	1.5	0.9	0.4	0.7	2960

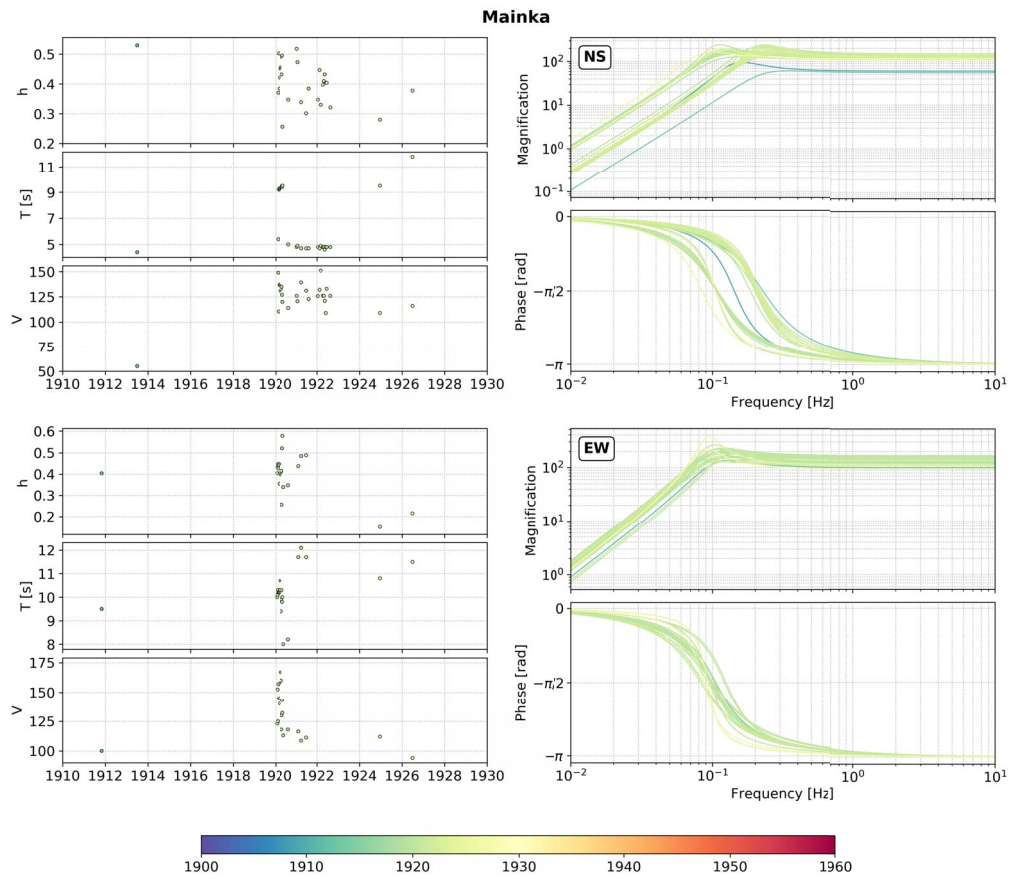
\* Corresponding author.

<sup>1</sup>Here, the Fourier transform phase convention is such that for positive frequencies a time delay corresponds to a negative phase term.

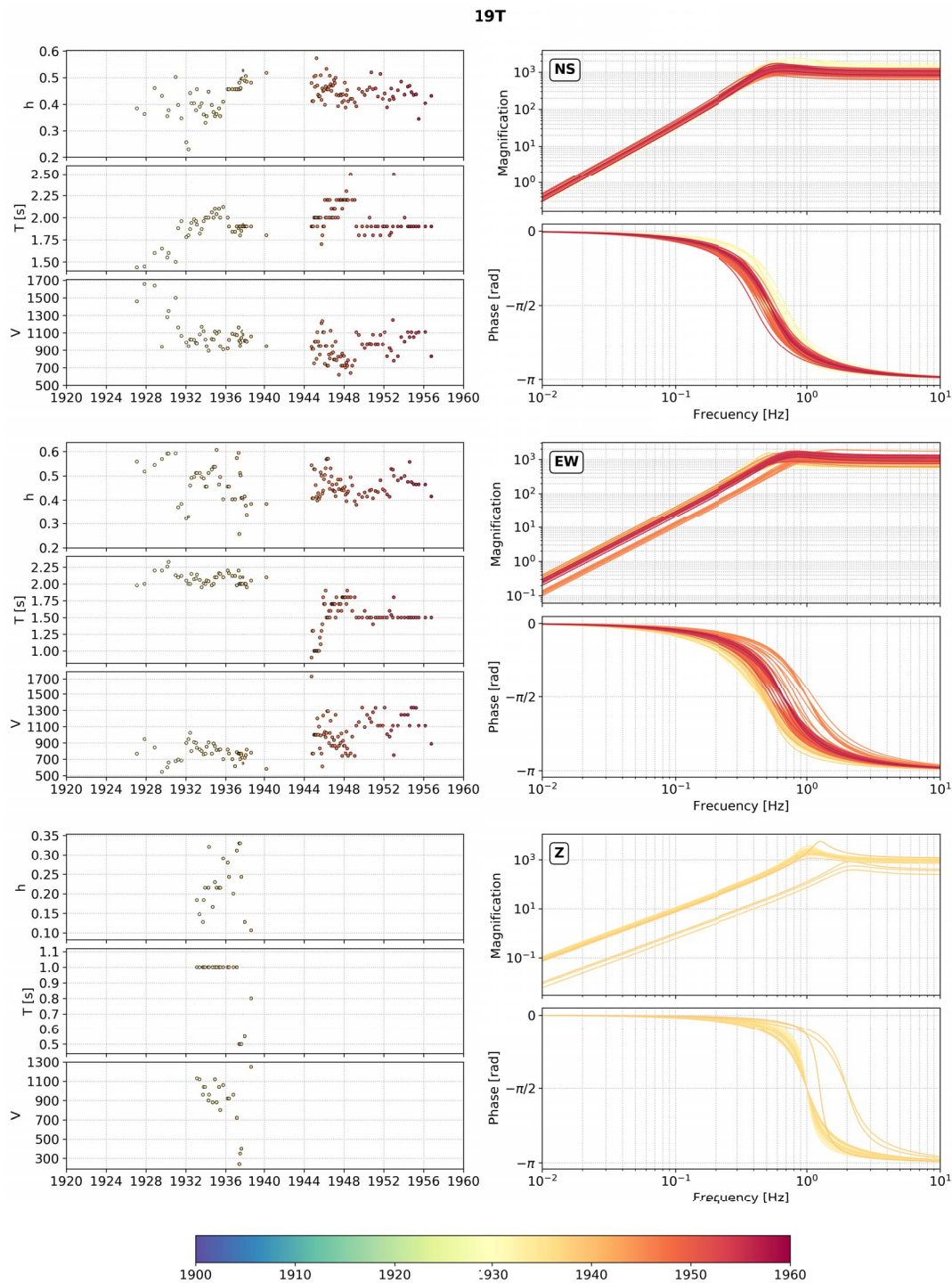
<sup>2</sup>Notice that ( $T_s, h_s$ ) and ( $T_g, h_g$ ) can be exchanged without modifying the magnification curve.



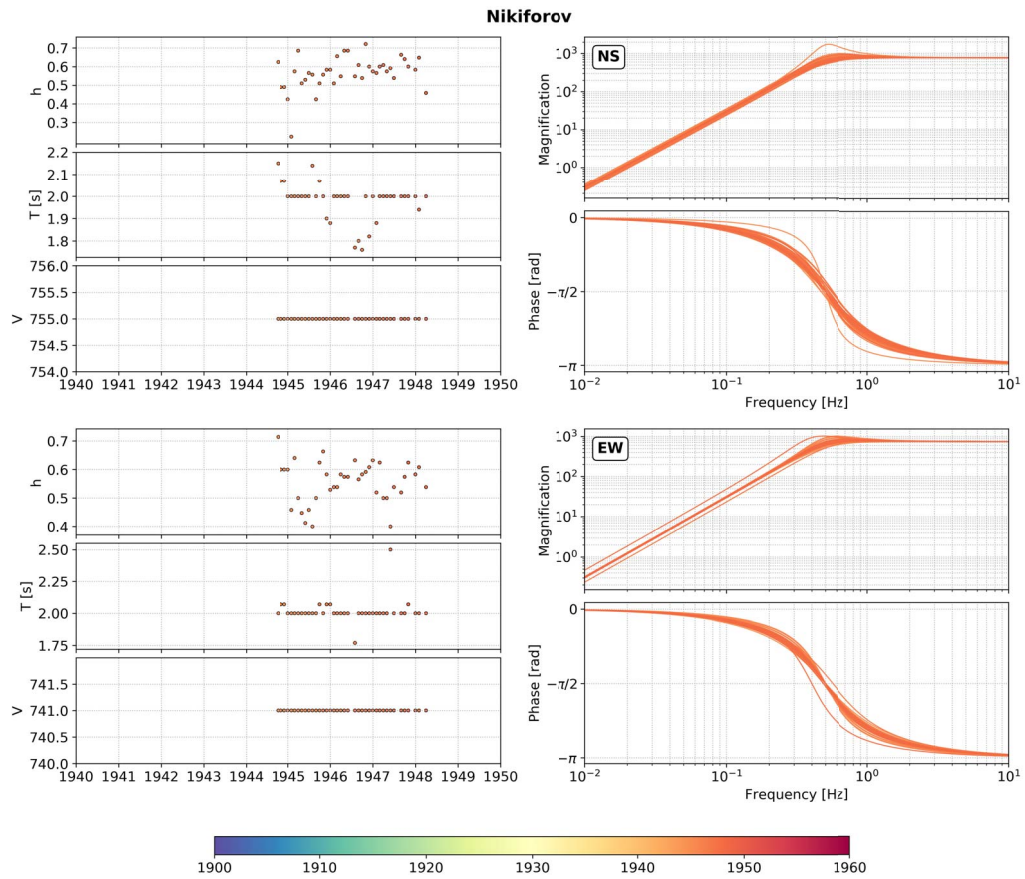
**Supplementary Figure S1.** Instrumental response of the Wiechert seismographs in the Strasbourg station. For each component, the instrumental constants extracted from the stations books (see red dots on Figure 1 of the main text) and the corresponding magnification and phase curves are represented. The color scale informs about the date (1900–1960).



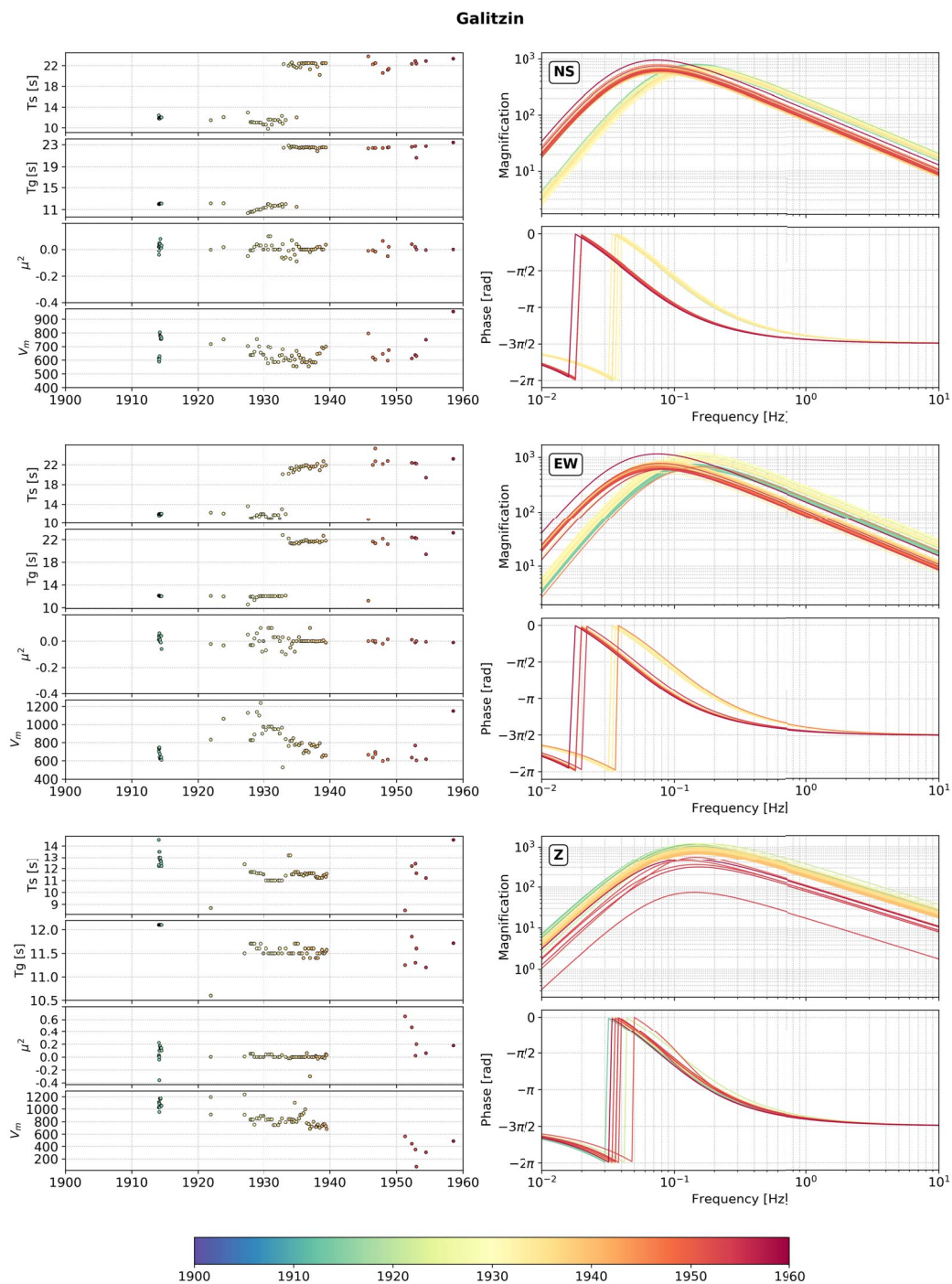
**Supplementary Figure S2.** Instrumental response of the Mainka seismograph in the Strasbourg station. Same representation as in Figure S1.



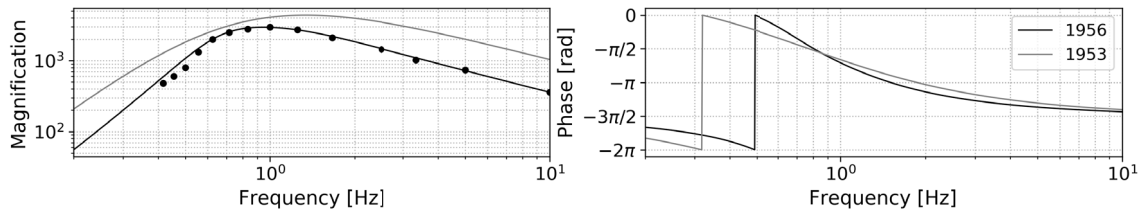
**Supplementary Figure S3.** Instrumental response of the 19T pendulum in the Strasbourg station. Same representation as in Figure S1.



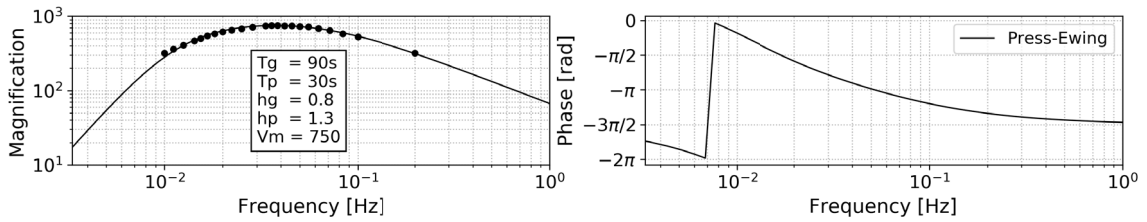
**Supplementary Figure S4.** Instrumental response of the Nikiforov seismograph in the Strasbourg station. Same representation as in Figure S1.



**Supplementary Figure S5.** Instrumental response of the Galitzin seismographs in the Strasbourg station. Same representation as in Figure S1.



**Supplementary Figure S6.** Instrumental response of the Peterschmitt seismograph (CPP) in the Strasbourg station. The 1953 curve corresponds to the constants in Charlier and van Gils [1953]. The 1956 one is obtained by fitting magnification values (dots) from calibration tests.



**Supplementary Figure S7.** Instrumental response of the Press-Ewing seismographs (ZNE) in the Strasbourg station before 1976.

## References

- Charlier, C. and van Gils, J. M. (1953). *Liste des Stations Séismologiques Mondiales*. Observatoire Royal de Belgique, Uccle.