

Supplement Figures

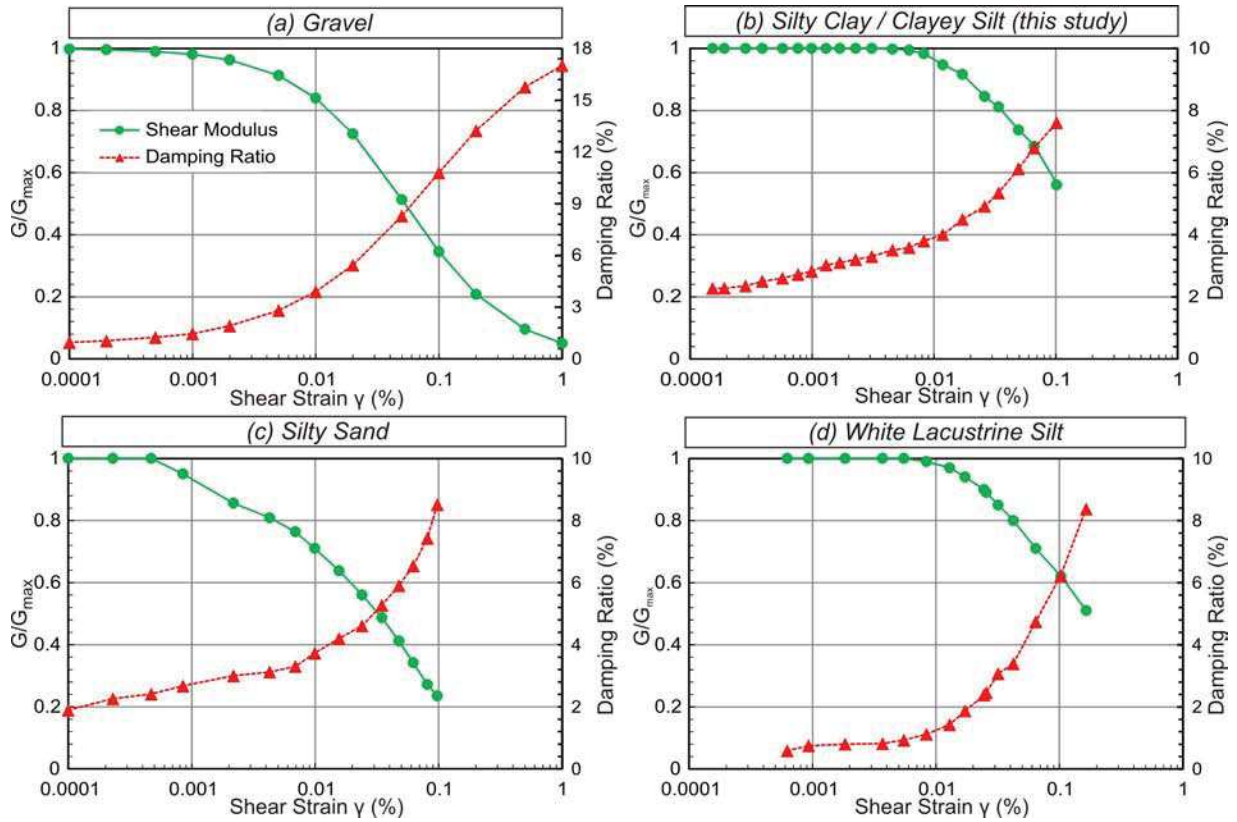


Figure S1. Variation of stiffness decay G/G_{max} and damping D curves with different shear strain (γ) used in the 1-D numerical analyses. Non-linear behaviour of the gravel (a) from MS Working Group (2008), of silty clay/clayey silt (b) from laboratory tests (this study), of silty sand (c) and white lacustrine silt (d) from MS-AQ Working Group (2010).

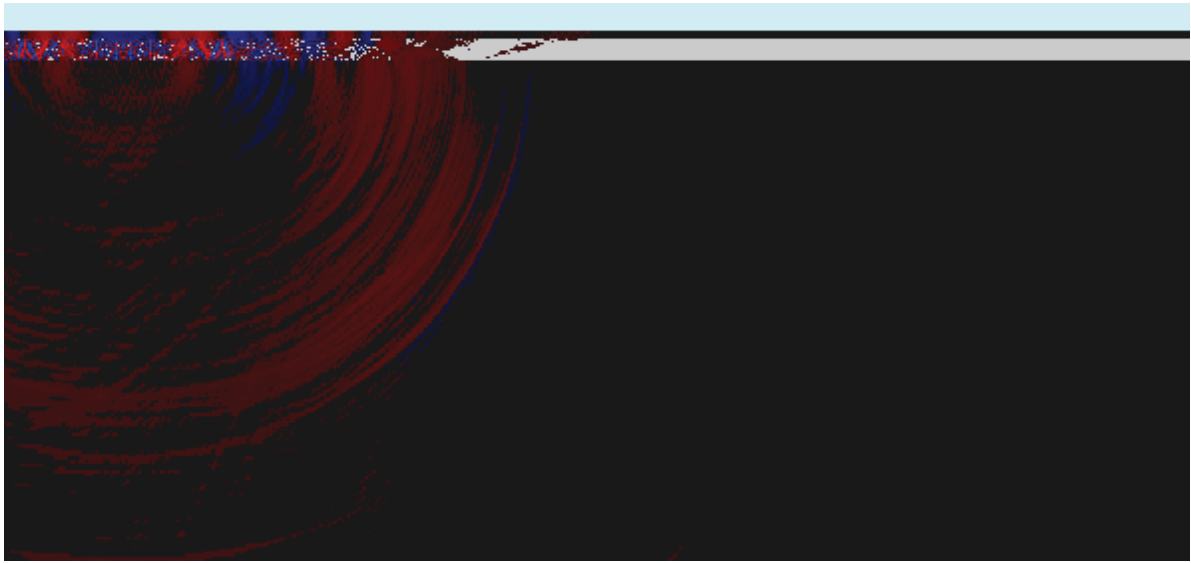


Figure S2. Snapshot of the wavefield (at a generic time t) generated by a Dirac source placed in the soft layer at the left of the model, which is characterized by an uppermost stiff layer (*stiff model*). The computational domain was $2000 \cdot 900$ m (x, z); the Dirac source was initially situated at the point with coordinates $200, 875$ m.

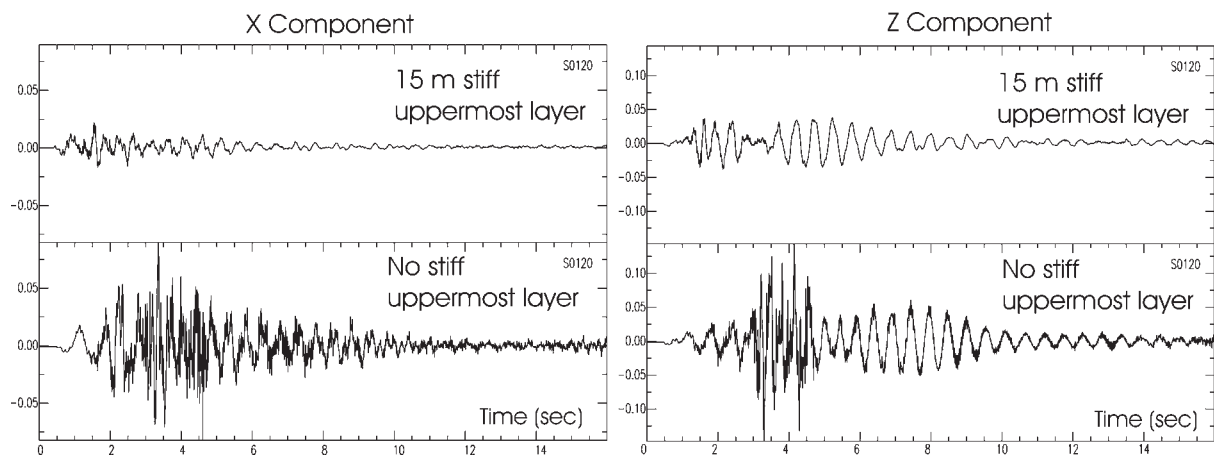


Figure S3. Synthetics for the *stiff model* (top) and the *soft model* (bottom). The synthetics refer to a receiver located at $x=798\text{m}$ (receiver number 120). The horizontal x component is shown on the left panel, the vertical z component is on the right panel.

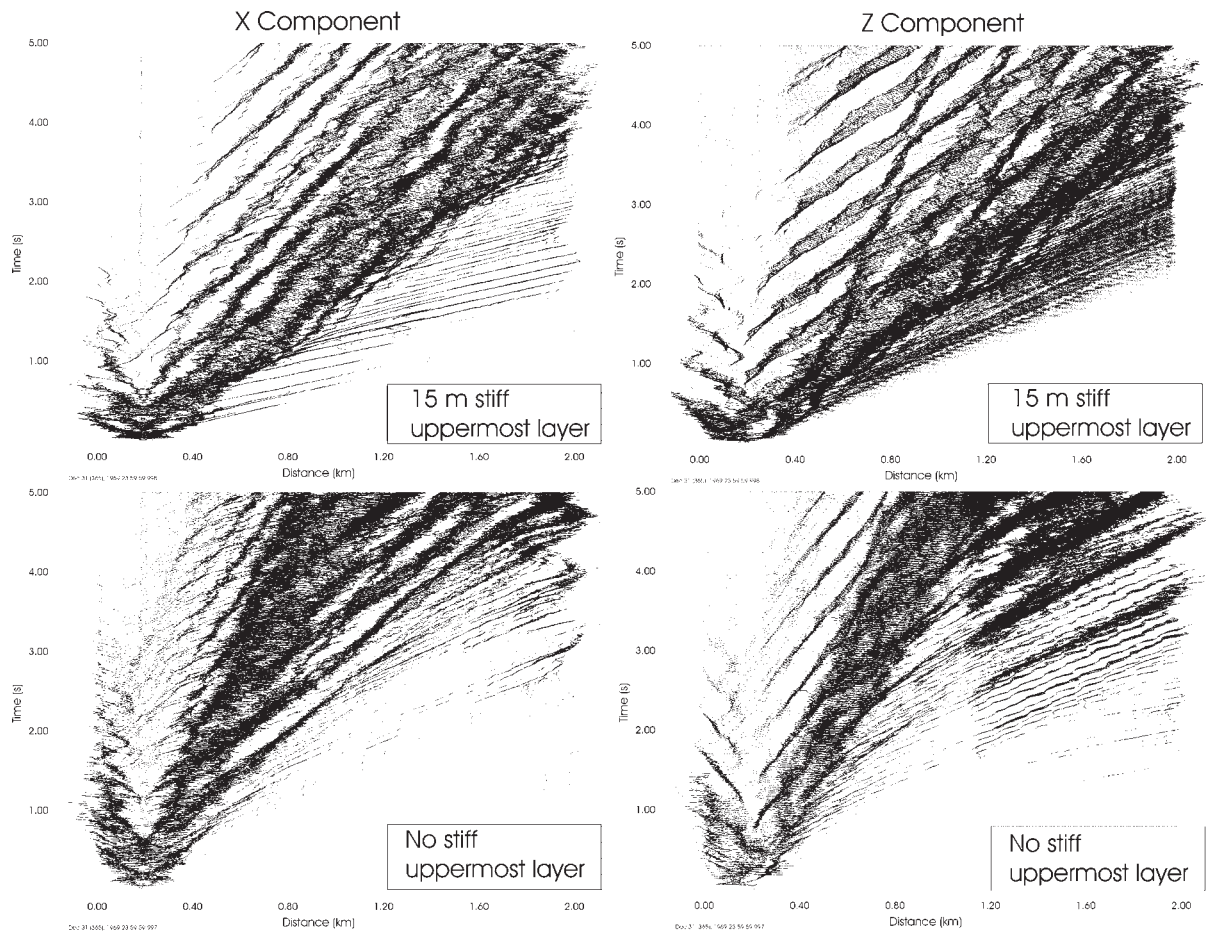


Figure S4. Stack of the time series of synthetics (for 5 s of simulation) for the *stiff model* (top) and *soft model* (bottom). The x component is shown on the left panel, the vertical component on the right panel.

Supplement Table

Strain (%)	G/G _{max}	Damping (%)
0.0002	1.000	2.27
0.0002	1.000	2.28
0.0003	1.000	2.35
0.0004	1.000	2.50
0.0006	1.000	2.60
0.0008	1.000	2.72
0.0010	1.000	2.82
0.0013	1.000	3.02
0.0017	1.000	3.10
0.0023	1.000	3.20
0.0031	1.000	3.30
0.0046	0.998	3.50
0.0063	0.994	3.58
0.0083	0.983	3.80
0.0118	0.947	4.00
0.0171	0.916	4.49
0.0261	0.845	4.91
0.0339	0.812	5.35
0.0495	0.737	6.13
0.0666	0.687	6.80
0.1017	0.565	7.61

Table S1. Characteristics of silty clay/clayey silt in terms of stiffness decay (G/G_{max}) and damping curves with different shear strain (Fig. X1 b). The curves are derived for this study from a cyclic, dynamic laboratory test (resonant column) on an undisturbed borehole sample.