This is the first detailed complex microfacies study accomplished for the Middle Jurassic hardgrounds from Bucegi Mountains and the results allow some refinements for the interpretation of the marine depositional environment during the Bathonian – Callovian interval of this part of the Getic geotectonic unit.

Analysis of the ambient seismic noise at the Romanian BB stations for estimating the crust structure

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In the last five years the National Institute for Earth Physics (NIEP), Romania, has developed its real-time seismic network. At present, NIEP operates 75 seismic stations equipped with both velocity and accelerometer sensors. Among these, 34 stations are equipped with broadband velocity sensors (CMG3ESP, CMG40T, KS2000, KS54000, STS2). The data are continuously recorded and transmitted to the Romanian Data Centre (RONDC) where Antelope 4.11 is running for acquisition and processing. In this study, we use ambient seismic noise recorded during one year (2009) at the Romanian broadband network to investigate the characteristics of ambient noise cross-correlations at more than 500 station pairs, distributed at distances between 10 and approximately 600 km. To lower the influence of the earthquake-related signals a nonlinear procedure is applied. The day traces are processed in 23 one-hour segments starting at 00:30 and ending at 23:30 to avoid possible data loss at the beginning and end of the day due to the start and end time of the original raw data. The one-hour segments are spectrally whitened to produce a flat amplitude spectrum in the 0.02–5 Hz band. All 23 one-hour cross correlations are stacked to create a day cross correlation and all available day stacks for a given station pair are stacked to produce the empirical Green's functions. If the seismic noise was isotropic, the Green's function would show symmetry around t=0. Such symmetry is present in some cases, especially for longer periods (> 20 s). To get the 'symmetric' component of the Green's function we average the positive and negative parts of the cross-correlation. The analysis of the 'symmetric' cross-correlations shows that it is possible to identify a wave which is coherent over the whole distance range, in the period range 6-30 s. As the vertical components of ambient noise are cross-correlated, this wave is identified as the fundamental mode of the Rayleigh wave. FTAN analysis is used to extract the group velocities of the estimated dispersive waves.

For five stations we check the variability of the cross-correlations over a period of time of 4 years (2006-2009). We perform the analysis for the two spectral bands corresponding to the primary (10-20 s) and secondary (5-10 s) microseism and also for the 20-30 s band. We observe no variations from one year to another and smaller amplitudes for the noise cross-correlations during the summer time (April-September) than those obtained for the winter time (October-March), indicating the stability of the noise sources over time.

This work provides very useful data for future tomographic studies in Romania at crustal level, considering that new data from other 32 temporary broadband stations (South Carpathian Project – SCP, 2009-2011) deployed on the Romanian territory will become available.