



Ambient seismic noise suppression in COST action G2Net

Velimir Ilić¹, Alessandro Bertolini², Fabio Bonsignorio³, Dario Jozinović⁴, Tomasz Bulik⁵, Ivan Štajduhar^{6,8}, Iulian Secrieru⁷, and Soumen Koley²

¹Mathematical Institute of the Serbian Academy of Sciences and Arts, Serbia

²National Institute for Subatomic Physics, Netherlands

³Heron Robots, Italy

⁴Istituto Nazionale di Geofisica e Vulcanologia (INGV), Italy

⁵Astronomical Observatory, University of Warsaw, Poland

⁶University of Rijeka, Faculty of Engineering, Croatia

⁷Institute of Mathematics and Computer Science, Moldova

⁸University of Rijeka, Center for Artificial Intelligence and Cybersecurity, Croatia

The analysis of low-frequency gravitational waves (GW) data is a crucial mission of GW science and the performance of Earth-based GW detectors is largely influenced by ability of combating the low-frequency ambient seismic noise and other seismic influences. This tasks require multidisciplinary research in the fields of seismic sensing, signal processing, robotics, machine learning and mathematical modeling.

In practice, this kind of research is conducted by large teams of researchers with different expertise, so that project management emerges as an important real life challenge in the projects for acquisition, processing and interpretation of seismic data from GW detector site. A prominent example that successfully deals with this aspect could be observed in the COST Action G2Net (CA17137 - A network for Gravitational Waves, Geophysics and Machine Learning) and its seismic research group, which counts more than 30 members.

In this talk we will review the structure of the group, present the goals and recent activities of the group, and present new methods for combating the seismic influences at GW detector site that will be developed and applied within this collaboration.

This publication is based upon work from CA17137 - A network for Gravitational Waves, Geophysics and Machine Learning, supported by COST (European Cooperation in Science and Technology).