



Integrated Ground Penetrating Radar and Electric Resistivity Tomography Surveys at Gubbio Tawn Walls

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One of the main risk factor occurring at Gubbio, a historical town in Italy, is the presence of a significant soil accumulation around the medieval Walls. Indeed, it has been estimated that currently there are more than 5 or 6 m of ground accumulation pressing on the Walls and that the soil amount increases progressively with a rate of around 50 cm / century.

Such a phenomenon is due to torrential rains and represents a hydrological issue associated with the landslide, whose monitoring requires the study of the subsoil features in order to foresee possible evolution in time and to mitigate the related effects properly.

Based on this requirement, a measurement campaign involving both ground penetrating radar (GPR) and electric resistivity tomography (ERT) was performed in July 2017, in the frame of the Horizon 2020 project HERACLES. Both ERT and GPR provide images, which are, in some way, a snapshot of certain soil features at the time when the surveys were performed. In particular, ERT surveys provided images of the spatial distribution of the electrical resistivity contrast of the soil under test useful to identify ground features and detect the boundary between sliding material and bedrock. At the same time, GPR provided vertical transects showing subsurface inhomogeneity in terms of dielectric permittivity, which were valuable to gather information about soil stratigraphy, at higher resolution compared to the ERT but with smaller depth penetration.

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