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Geoscience Program for High School Education: the Liceo Magrini Microzonation Experience (Liceo Scientifico Statale "Luigi Magrini", Gemona del Friuli, Udine, Italy)

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The Geoscience Program at Liceo Magrini (Liceo Scientifico Statale "Luigi Magrini", Gemona del Friuli, Udine, Italy) involves teachers and research scientists at the Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS) to implement education programs with the goal of addressing a critical approach to seismic hazard reduction. The Liceo Magrini is set in Gemona del Friuli (Udine, Italy), the town most affected by the Friuli earthquake in 1976. Due to this reason, the seismic hazard and earthquake mitigation are arguments very close to the school population.

Being well known students learn more and enjoy classes more when visual and active learning are incorporated into the lecture, the Geoscience Program is divided into theoretical seminars, demonstrations and hands-on activities in the classroom, summer stages that the students perform at the OGS Seismological Department. In particular, this year, in the framework of the Italian National Initiative "Settimana del Pianeta Terra", the Liceo Magrini promoted a study of how the ground responds to an earthquake at different locations (seismic microzonation) within the area the Gemona del Friuli town.
Supported by the OGS researchers, the Magrini students acquired, processed and interpreted seismological data to understand how the effects of an earthquake can be mitigated, starting from the soil response during an earthquake. Targeted analysis of specific physical characteristics of the soil foundation (resonance frequencies, damping or amplification of seismic waves, liquefaction of soils) identify areas of similar seismic behavior. Such bulk of information is fundamental to the planning phase of a new structure or the adaptation of an existing one.
Under the guidance of an expert seismologist the students designed and conducted the experiment. They identified 15 target sites (main historical buildings,hospital, fire station, schools), spanning from rock to soft soils. They performed measurements and elaborated the collected data, following standard procedures (i.e. Nakamura technique) used in seismology for such kind of investigations. Their findings proved that during a seismic event the effect at sites can be different at depending on theri resonance frequency site.
After finding the resonance frequency they observed that common features can be found on soft soil site, with low amplifications in the frequency band 1-2 Hz, while rock site show flat response for all frequencies. That is in agreement with what is already known from literature.