



## **Underwater radon monitoring in flooded mining environments**

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The radioactivity level in the air and water of underground environments, particularly caves and mines, is very relevant for both geophysical exploration and radio-protection purposes. Mining environments are characterized by an increased health risk from exposure to natural ionizing radiation. Thus knowledge of the environmental radioactivity levels in caves and mines, and the corresponding temporal patterns, is fundamental to assess the radiological risk for mining workers or cave's visitors. Furthermore, due to its unique noble gas character, radon is a useful natural tracer to assess ventilation and dynamical geophysical processes in underground environments. The underwater monitoring of radon is particularly relevant due to the abundance of flooded mines in Europe and the perspective enabled by recent technological developments in the field of robotics and autonomous systems of further exploiting these flooded resources. In this context a fully-autonomous system for underwater radiation monitoring (up to depths of 100 m) was developed, being able to operate either in stand-alone mode or on-board underwater platforms / robotic vehicles. This new underwater monitoring system will be presented, including the results of validation of the system in tank conditions. Furthermore, new results from preliminary field monitoring at the Malaposta quarry and at the former Urgeiriça uranium mine (Portugal) will be presented.