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The use of tracer gases to study the air exchange in the Altamira cave

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The use of radon as an atmospheric tracer provides information about the gaseous exchanges in subterranean places such as caves. In the Altamira Cave over the past 30 years radon measurements have provided relevant information about gaseous exchanges between the Polychromes Room, plenty of Paleolithic rock paintings, the adjoining Chambers inside the cave, and the outside atmosphere. The relatively simple physico-chemical behaviour of radon gas provides a marked advantage over other tracer gases that are usually present in high concentrations in hypogeous environments, such as CO_2. In this work the distribution of radon and CO_2 concentrations in some chambers of the cave is presented together with other environmental parameters such as temperature, pressure and air density, which are monitored continuously inside the cave. From the continuous data series of these parameters, correlations with tracer gases were calculated, providing the exchange mechanism between the cave and the outer atmosphere. In this presentation related with the updated degree of connection from the first data available in the 80's to nowadays will be shown.