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Light phenomena used to search for hydrocarbon deposits

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The oilfield in Vallezza, North Western Italian Apennines, disused for several years, offered a chance to experience a potential link between the presence of hydrocarbons in the underground and recurring anomalous light phenomena in the atmosphere observed in the same area [1].

Anomalous light phenomena in atmosphere are attracting a growing interest in the internazionale scientific community. The physical mechanisms underlying the dynamic triggering of the "Ball lightning" have not yet been fully understood, and are nowadays considered a frontier of science. Since 1983, in a vast area of the North Western Apennines, a field study has been carried on as an open-air laboratory to monitor the appearance of anomalous light phenomena in the atmosphere , by means of photo and



video cameras, and evidence collected on field. The BLs in the detection area are usually circular-shaped, appearing at different heights above the ground, showing with different colors, moving in the sky without sound or sometimes remaining motionless for several seconds before disappearing from view.

Detections have been intensified since 2008 and carried out in different geological contexts, peculiar to the North Western Apennines [2] and, in particular in tectonically active zones subject to a moderate seismicity [3]. In details, a particular type concerns BLs occurring even on a daily basis, generally two hours after sunset, in the area of the disused deposit in Vallezza [1]. The abundance of hydrocarbons in the subsurface is still significant and even today small amounts of oil naturally emerge from the soil.

Figure 1: Light phenomena photographed in the detection area on August 15, 2007.

In the area under investigation, there are hydrothermal springs and small mud volcanoes, where water and gas under pressure rise to the surface. These two phenomena are associated with saline substances, sodium chloride/bromide/iodide waters (which the zone abounds in), methane and hydrocarbons.

The experience in Vallezza, characterized by peculiar light phenomena in the atmosphere, could be transferred to other geological contexts for diagnostic research aimed at finding hydrocarbons.

References:

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[2] Straser V (2009) New Concepts in Global Tectonics Newsletter 53:47-56

[3] Straser V (2007) New Concepts in Global Tectonics Newsletter 44:17-31

