The remediation in the Orgnac visited sector has consisted in an artificial ventilation circulation that mimics the winter regime. The set point value of 0.5% CO_2 for diluted extracted air was optimized with a 3 000 to 5 000 m^3/h flux. Until now, the monitoring has revealed that the original thermo-hygrometric conditions are preserved. In Chauvet cave, neither ventilation nor hydrological conditions can possibly be modified. Critical situations could be triggered by long lasting droughts expected in the Mediterranean climate foreseeable evolution. Only the vegetal cover could be a factor of control pending confirmation of the preliminary results.

M2: Stalactite drip rate variations in French Caves: causes and interest for karstic reservoir knowledge

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Stalactite dripping time series, originally set up in order to better understand the stalagmite growth environment in relationships with paleoclimatologic studies, appear to be a source of valuable information on infiltration and recharge processes in micro-fissured karstic terrains. The synthesis of several years long monitoring (drip number/15 min) from 25 drippings stations in ten different caves have been compared with local meteorological data, revealing common causes of dripping pacing at different time scale: rainfall (RR) and evapotranspiration (ETP) constrain seasonal and monthly-weekly drip rate variations while atmospheric air pressure controls daily-hours scale drip variations. More precisely, we observed the following:

1) RR minus ETP baseline displays a well-marked seasonality that is the precursor of the dripping yearly seasonality;

2) water excess (or efficient rainfall) explains monthly-weekly drip rate variations during humid period with more or less delay of the order of 1-2 days;

3) large atmospheric air pressure changes linked to atmospheric circulation controls daily scale drip variations;

4) small atmospheric (barometric) tides with 8H, 12H/S2, 24H/S1 periodicities, are the causes of short terms drip changes which sensitivity is controlled by the karst saturation. Mechanism of the influence of air pressure wiggles on the dripping rate is put in relation with the humid/dry season of each site, leading to a conceptual physical model. The barometric effect, quantified in several dripping sites, is compared with the physical characters and to the geology of the sites.

Near Chauvet and Aven d'Orgnac sites (Ardèche, S-France), an associated borehole monitoring demonstrates the close but complex relationship between piezometric level, stalactite drip rates and water excess, giving detailed evidence of interconnections at various spatial scales in karst aquifer. Finally, we observe and describe, for the first time, the strange graphic patterns that appear when comparing two or three synchronized dripping time series each other in the same cave. These enigmatic figures, which suggest non-linear couplings with bifurcation dynamics, may be related to reservoir interconnections or disconnections above the stations opening a potential window to the infiltration processes and micro-fissure geometry.

M3: In situ optical measurements of water film thickness on caves walls and speleothems

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Most walls of karstic cavities are coated with a thin film of water involved in the thermo-hydric and gaseous exchanges between rock walls and cave atmosphere. In painted caves, thickness and stability of the water film are critical to the conservation conditions of paintings. Indeed, the water film can either run off, be involved in condensation/corrosion processes, or induce concretionning by degassing or evaporation. The thickness measurement of the water film on the cave wall and its temporal evolution are essential parameters for the conservation of rock art heritage that have not been measured until now. They are also key parameters for the modelling of cave concretions growth. Those parameters are sensitive to the internal areological conditions of the cavity and could be impacted by global warming.

A contactless optical sensor, commercialized by Micro-epsilon with resolution levels of 1 µm and a measuring range of 0 to 300 µm, was selected as the most suitable measuring device for water film thickness. When the light is reflected by a surface, a single wavelength is focused at the