



## EXPERIMENTAL INVESTIGATION ON SURFACE MONITORING OF MATERIALS

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**ABSTRACT:** Cultural works of art are susceptible to deterioration with environmental changes causing imperceptibly slow but steady accumulation of damaging effects directly impacted on structural integrity. Climate Change is one of the most critical global challenges of our time and the burdened cultural heritage of Europe is particularly vulnerable to be left unprotected. Climate for Culture project exploits the damage impact of climate change on cultural heritage at regional scale.

In this paper a study with in situ measurements and investigations at Europe cultural heritage sites feeding in laboratory simulation methodology is described. Laser holographic interference method is employed to provide remote non destructive field-wise detection of the structural differences occurred as climate responses. Results from climate simulation of two climate zones are presented. Development of a third generation user interface software optimised portable metrology system (DHSPI II) is designed to record in custom intervals the surface of materials witnessing reactions under simulated climatic conditions both on-field and in laboratory. The climate conditions refer to real data-loggers readings representing characteristic historical building in selected climate zones. New generation impact sensors termed Glass Sensors and Free water sensors are employed in the monitoring procedure to cross-correlate climate data with deformation data. In this paper results from the combined methodology are additionally presented.