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Mobile optical surface and material documentation and analysis of his-torical documents and textiles

Wolfgang P. Weinhold (1), Feng Gao (2), Yang Wang (3), and Winfried Weinhold (1)
(1) Innowep GmbH, Wuerzburg, GERMANY, (2) Academy for Cultural Heritage, Beijing, CHINA, (3) AMT Beijing, CHINA

Chinese paper documents and textiles older than two thousand years were found in a tomb. A new fully mobile and destructive free method for highly pre-cise multiple and simultaneous measurement of surface topography, roughness and structure, visual surface impression and micro transparency at the same area with the same resolution has been applied to the documentation and analysis of these historical paper documents and textiles. Tactile methods which are commonly used for roughness measurements are often very precise but will even under low loads modify and change the surface and material structure and real topography, especially when applied on sensitive surfaces like paper and textile. Optical methods for roughness measurement do provide only values for the topography but have no means to measure the values for transparency and cloudiness. To measure the visual impression in a reproduceable and calibrate-able fashion is not known for optical topographical methods and is impossible for tactile methods. A clear distinction between micro and macro structure and pattern of the found materials was accomplished. Due to the mobility and flexi-bility of the system it was also used directly at the tomb to document the materi-als and surfaces at an original state. Additionally this new system helped to un-derstand the build up of the original material, its inner structure and the original historical manufacturing process. By this it was much easier to identify and proof the best cleaning restoration and conservation procedure.
The work was a cooperation between the Academy for Cultural Heritage China, Innowep Germany and AMT Beijing.