

Article

X-ray Imaging Investigation on the Gilding Technique of an Ancient Egyptian Taweret Wooden Statuette

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Abstract: Diagnostic physical methods are increasingly applied to Cultural Heritage both for scientific investigations and conservation purposes. In particular, the X-ray imaging techniques of computed tomography (CT) and digital radiography (DR) are non-destructive investigation methods to study an object, being able to give information on its inner structure. In this paper, we present the results of the X-ray imaging study on an ancient Egyptian statuette (Late Period 722–30 BCE) belonging to the collection of Museo Egizio in Torino and representing an Egyptian goddess called Taweret, carved on wood and gilded with some colored details. Since few specific studies have been focused on materials and techniques used in Ancient Egypt for gilding, a detailed investigation was started in order to verify the technical features of the decoration in this sculpture. Specifically, DR and CT analyses have been performed at the Centro Conservazione e Restauro “La Venaria Reale” (CCR), with a new high resolution flat-panel detector, that allowed us to perform tomographic analysis reaching a final resolution better than the one achievable with the previous apparatus operating in the CCR.

Keywords: cultural heritage; archaeometry; conservation; wooden sculpture; ancient Egypt; tomography; gilding

1. Introduction

Since the first X-rays radiograph by Roentgen in 1895 and the first application on archaeological finds in 1898, the importance of this imaging technique in cultural heritage was clear. Hence, after more than a century, the potentialities of X-ray radiography are widely known in the field [1]. Moreover, starting from the 1970s, the introduction of computed tomography (CT) added a new powerful non-destructive X-ray technique for the investigation of 3D artworks [2]. The application of CT was introduced to the art and archaeological fields primarily as a tool for analysis of human and animal remains [3–8], and then to study other kinds of objects made with various materials, such as glass, metal,