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# Capability of conoscopic holography for digitizing and measuring of layer thickness on PLA parts built by FFF

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## Abstract

To reduce geometrical errors in AM parts, use of inspection systems becomes essential. In this work, a non-contact inspection technique based on conoscopic holography (CH) for digitizing PLA parts produced by FFF on different colours and thicknesses is analysed. Tests were performed to check the quality of digitized point clouds, based on indicators related to the proportion of points captured and the quality of the signal acquired by the sensor. The thicknesses of deposited material were determined and compared to the nominal values. CH was revealed as a valid technology for digitizing and geometrical analysis of PLA parts.

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## 1. Introduction

Additive manufacturing (AM) refers to a class of technology for direct construction of physical parts from 3D CAD models by a layered manufacturing process. In this process, factors such as the conversion of the CAD model to STL format, as well as process parameters settings, machine errors or material shrinkage, bring about deviations that affect the geometrical accuracy of the resulting part, compared to the CAD model.

Numerous contributions have been made in the recent years in order to evaluate and compensate for these geometrical errors. Many of these works aimed at modifying the geometrical shape of the CAD model through the off-

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