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# Conoscopic holography systematic error processing by means of gaussian filters

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**Abstract**

This work analyses the directional effect shown by the point clouds when digitizing with a conoscopic holography (CH) sensor. The asymmetric shape of the laser spot for this sensor yields that directionality appears along the greatest spot length and it occurs repeatedly under different working conditions. To study this effect of the sensor, several tests were performed on a surface machined by EDM with a very uniform and isotropic finish, so that the directional effect should not appear actually. This ensures that the effect is a systematic factor related to the sensor and feasible to be compensated. A Gaussian filter is used with this purpose. The results found before and after applying the filter were compared with those obtained by a confocal microscope, which was used as reference due to its better metrological performance.


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*Keywords:* Conoscopic holography, directionality, systematic error, Gaussian filtering

## 1. Introduction

Conoscopic holography (CH) is an interferometric technique based on the double refractive property of birefringent crystals. It was first described by Sirat and Psaltis [1] and patented by Optimet Optical Metrology LTD. The underlying physical principle of measurement of this type of sensor is included in the guideline VDI/VDE 2617-6.2 [2].

The characteristics of the CH sensors include high accuracy and repeatability, good behaviour for a wide variety of materials, ability to digitize steep slope surfaces and feasibility to combine the sensor with different lenses to adapt

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