

Non-contact, simultaneous acquisition of topography and spectral data of an object

Background

Scientists at the Institute for Laser Technologies in Medicine and Metrology (ILM) at the University of Ulm, funded by the Baden-Württemberg Stiftung gGmbH, have now combined two conventional optical methods, which enable a parallel and thus considerably faster and cheaper acquisition of different parameters of a sample.

Problem

At present, several instruments are required to record the topography and spectral properties of an object. Although the chromatically coded 3D measurement technique is capable of measuring highly scattering objects, something other topography measurement systems cannot do, its confocal measurement principle does not allow for any overarching spectral acquisition. As a result, there is an increased need for space and time as measurements are taken with different devices.

Solution

The basic idea of the invention is to combine a multifocal, chromatic coded 3D measuring system with an external light source. When a homogeneous light is activated, remission can be detected in the entire spectral range across the surface. However, the chromatic error of the topographic measurement system would normally reduce the spatial resolution of the spectral measurement. In the procedure presented here, this error is minimized by the fact that the areas covered are weighted depending on the topography coverage. The spatial resolution of the hyperspectral measurement can thus be successively improved through multiple measurements taken at different distances.

As the methods and feedback for mutual improvement are combined, topography and hyperspectral measurements can now be performed in parallel on three-dimensional objects.

Contact

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Patent Situation

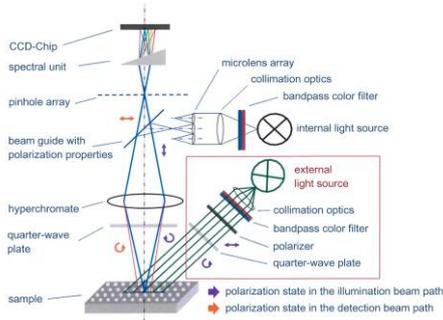
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validated

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Service

TLB GmbH is in charge of the management of the invention till it is marketable and offers companies the opportunity of licensing or cooperation for advancement.



Invented design with polarized illumination and detection (with additional gloss suppression). Bandpass filters in front of both light sources are used to adjust the spectral ranges [University of Ulm].

Advantages

- 3D measuring system can be used for hyperspectral measuring
- Cost reduction through shape and color measurement with a single device
- High measuring speed without motion artifacts
- Material differentiation possible
- Space saving & use of existing equipment

Application

The simultaneous acquisition of topography and spectral data of an object is of interest to many areas of science and technology. These include quality testing in industrial production processes, automated material differentiation and sorting or more comprehensive analyses of tissues for medical purposes, such as performed in stomatology.