Intelligent indicator materials to enable accurate imaging of electromagnetic distribution in the field: microwave thermograph

- SCHEDA
- APPROFONDIMENTI

Identificativo proposta:TODE20211008001 **RICHIEDI MAGGIORI INFORMAZIONI**

A German university offers a new method for microwave thermography that uses a commercially available high definition (HD) optical camera and an indicator plate to convert microwaves into a high-resolution, digital field distribution. It has a larger measuring range as the developed indicator plate allows microwave thermography between 1 GHz and 300 GHz. License agreements are offered.

In many applications in the field of high frequency technology – e.g. the calibration of measuring instruments or the verification of electromagnetic compatibility (EMC) requirements – the exact intensity distribution of electromatic fields is of great interest. Often, these fields are merely simulated or measured indirectly. Microwave thermography, on the other hand, can be used to show electromagnetic fields in real environments in a way that is accurate and space-resolved, i.e. outside of measurement laboratories. The new microwave thermography technique from a German university uses a commercially available optical HD camera and an indicator plate to convert the microwaves into a high-resolution, digital field distribution. The indicator plate consists of a multilayer system that performs both characteristic impedance matching as well as a conversion of the microwave fields into a thermal signature. The surface of the indicator plate is thermo-chromatic, so that microwave fields of different strengths are displayed using different colours. A normal optical camera can thus capture an image that allows the field distribution to be evaluated accordingly. This means that with the aid of an underlying model and appropriate calibration, microwave field distributions can be displayed and measured with a high resolution and a great deal of precision. The developed indicator plate allows microwave thermography between 1 GHz and 300 GHz. At the same time, less than 200mW are sufficient to determine the distribution of electromagnetic fields. In particular, the invention can be used for measurements outside of laboratories or measuring chambers, e.g. when checking the quality of microwave components in the field of manufacturing or when check the HF tightness of high-frequency devices, such as radar systems, in and on containers and tanks, as well as pipelines. Industrial partners with such applications and related measurement tasks are sought for licensing agreements to develop and use the technology.

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