

Terahertz technology for industrial applications

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Abstract—An overview is presented of recent industrial applications of Terahertz and some of the key challenges and solutions towards further the introduction of Terahertz systems into production environments.

I. INTRODUCTION

Terahertz technology based on the coherent emission and detection of Terahertz has been utilized for R&D purposes for almost two decades. During this period, the performance of the technology has improved in terms of signal to noise and frequency coverage, as well as other key performance criteria.

Over the past several years, there has been a substantial amount of activity exploring industrial applications of Terahertz, with a view to exploiting the ability of Terahertz to perform non-destructive testing and inspection, as well as its spectroscopic capabilities.

II. RESULTS

In several different industries, the transition from R&D tools into systems used in production environment has begun to occur. In this talk, we will review those applications in which this is now occurring, as well as those on the horizon. Examples of where the transition has already occurred in the solar cell inspection and pharmaceutical tablet coating thickness determinations^{1,2} are shown in Figures 1 and 2, respectively.

Improvements in the performance and reduction in the cost of the technology will also prove critical to this transition, and future performance requirements will be reviewed.

Finally, different applications are also likely to require different types of Terahertz (pulsed, cw) to meet the criteria of specific industries, and this will be explored.



Fig. 1. Terahertz solar crucible inspection system



Fig. 2. Terahertz system used to monitor tablet coating thickness in pharmaceutical coating drum.

REFERENCES

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