

Summit to: Methods and Physical Modeling in Nanomaterial Characterization

White electron beam technique in electron-beam based techniques

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EXTENDED ABSTRACT: There are a lot of electron-beam based techniques in surface analysis, and each of them has its own characteristics, but they also have, at least, one characteristic in common, the information about the target sample is obtained through the analysis of identified signal data. These techniques generally are inefficient for quantitative purpose because only the signal data contribute to the conclusions, while other detected data, the overwhelming majority of measured data, have been completely disregarded as undesirable background data. In this talk, we proposed a data-driven analysis method [1-3] to extract meaningful information from the background signal and to propose an important breakthrough for the next generation surface analysis. The unique feature of this method is to use the combinations of a large number of spectral groups measured by intentionally changing a plurality of experimental conditions, to describe the background data, instead of interpreting individual spectrum in terms of physically meaningful parameters. Some combinations provided an “intermediate level” between “background signals” and “understandable information,” which enabled a better understanding of measured backgrounds.

Keywords: White electron; Virtual Substrate Method

REFERENCES

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BIOGRAPHY



In 2008 Dr Bo Da obtained a BS in Physics from University of Science and Technology of China and in 2013 a PhD in physics from the same university. In November 2013 he moved to the National Institute for Materials Science (Tsukuba, Japan) as a Postdoctoral Research Fellow, becoming in January 2015 an ICYS Researcher at their International Center for Young Scientists, in December 2016 becoming a Researcher in the Center for Materials Research by Information Integration, and finally in April 2019 becoming a Senior Researcher in the Research and Services Division of Materials Data and Integrated System. His group published several papers related to these new methods in various journals, including Nature Communications, Physical Review Letters.