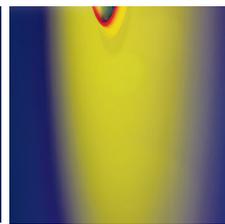
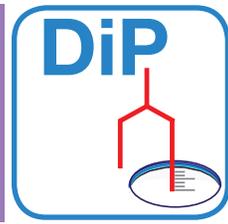
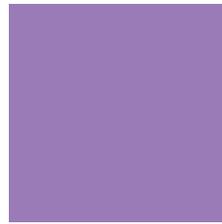
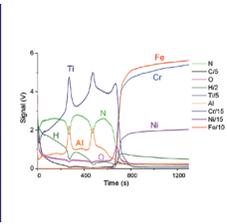
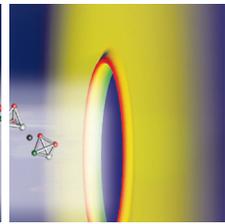
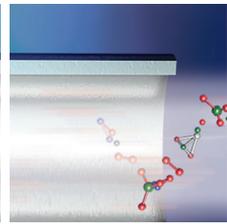
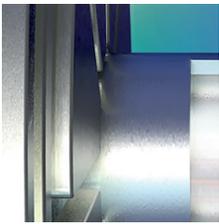
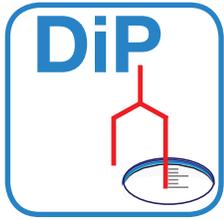


DiP Differential Interferometry Profiling



www.horiba.com
info.sci@horiba.com



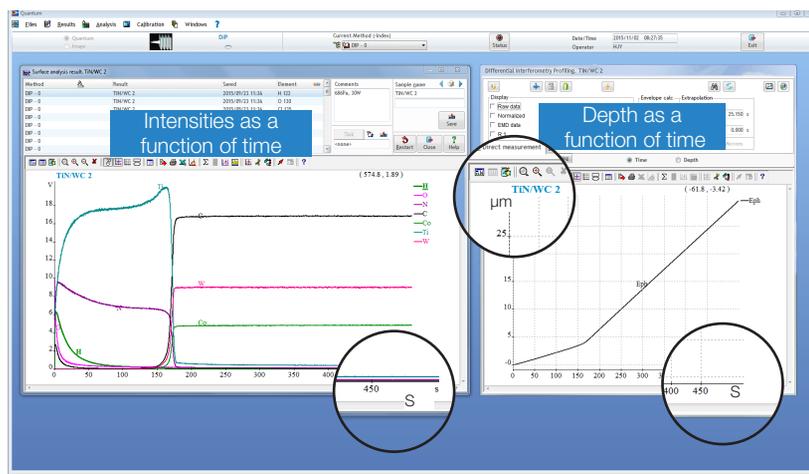
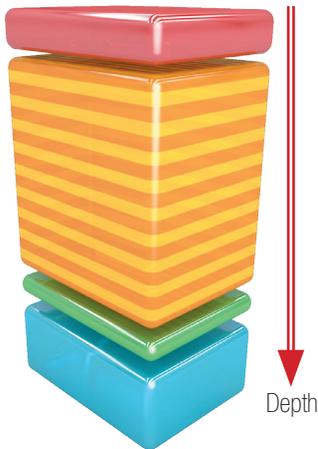
DiP: Differential Interferometry Profiling

An innovation in Glow Discharge Optical Emission Spectrometry (GDOES) relating to the direct measurement of layer thickness, erosion rates and GD crater depth.

GDOES is used for fast elemental depth profile analysis of thin and thick films with thickness ranging from one nanometer to over 100 microns. The erosion rates in GDOES are material dependent, and when multi-layers are measured, they change with depth. Previously, the estimation of these erosion rates was the result of calculations (prone to uncertainties) or external measurements.

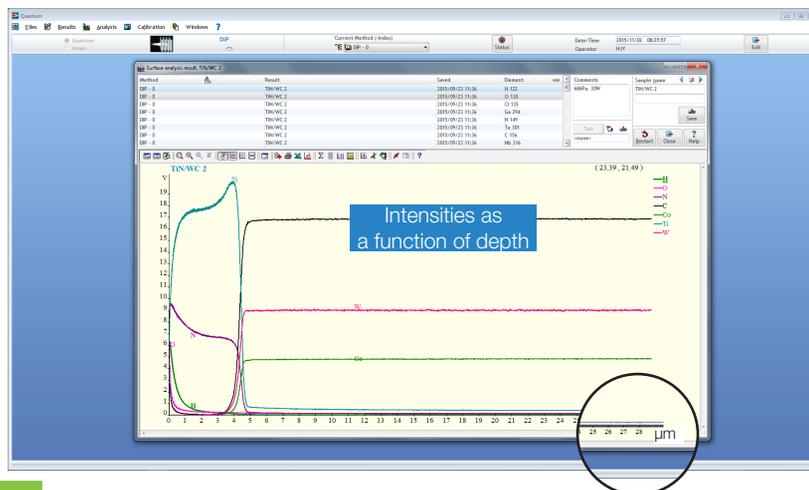
Thanks to DiP, a direct measurement of the depth as a function of time, with nanometric precision, is performed simultaneously with the GD analysis.

$$\text{Intensity as a function of time} + \text{Depth as a function of time} = \text{Intensity as a function of depth}$$



Surface Measurement and DiP windows.

In the DiP window (right) the changes of slopes reflect the changes in erosion rates between layers. These erosion rates are directly obtained by the interferometric measurement.



Measurement with time axis directly converted in depth using DiP in Quantum software.

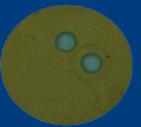
Domains of applications

Samples need to be partially reflective. Surfaces with low roughness are therefore preferred, but mirror surfaces are not mandatory. To the right are 2 samples of TiN/WC deposited by PVD (top) and by CVD (bottom). The top sample has a mirror like surface, while the lower one is less specular, but both are suitable for DiP.

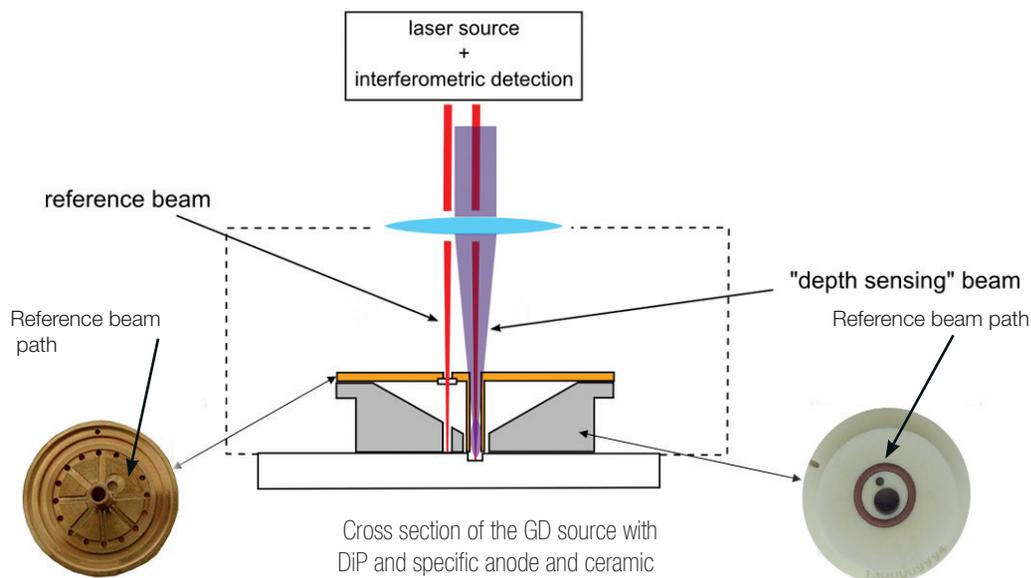
PVD coating
mirror surface



CVD coating



DiP operation principle: Interferometric measurement.



Sapphire sample: The two beams are visible by transparency

A laser source is separated into two beams: The reference one is directed on the intact surface of the sample, while the depth sensing one is directed on the middle of the GD measured area.

The interference between the two reflected beams is measured as the sample is sputtered, giving a direct measurement of the crater depth.

Upgrade existing GD instruments

DiP can be retrofitted on existing instruments as the design of the optical interface does not modify the light throughput towards the spectrometers.

HORIBA Scientific, Your partner for coatings and films characterization

Contact Us

France: Tel: +33 (0)1 69 74 72 00

USA: Tel: +1 732 494 8660

Japan: Tel: +81-(0)3 6206 4721

Germany: Tel: +49 (0)6251 8475-0

UK: Tel: +44 (0)20 8204 8142

Italy: Tel: +39 2 5760 3050

China: Tel: +86 (0)21 6289 6060

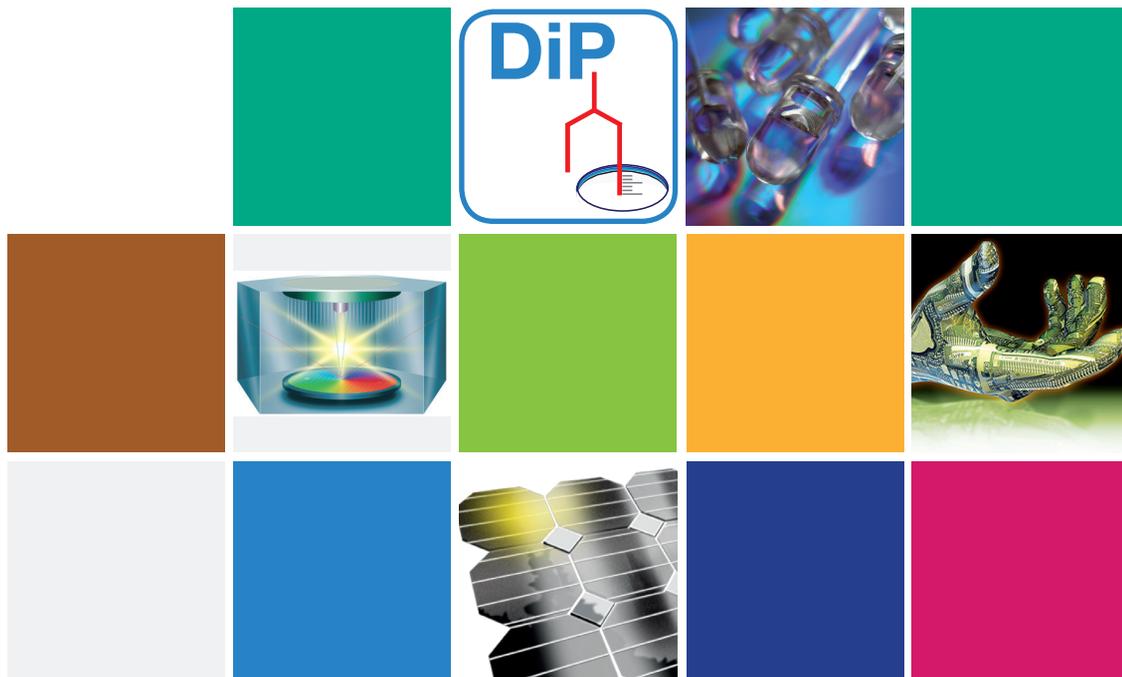
Brazil: Tel: +55 (0)11 5545 1500

Other: Tel: +33 (0)1 69 74 72 00

www.horiba.com/scientific

info.sci@horiba.com

Follow Us



Visit our web site www.horiba.com/scientific for more information and to read our application notes.

This document is not contractually binding under any circumstances -
Printed in France - ©HORIBA Jobin Yvon 10/2015