**INTRODUCTION**

Torsional subsurface probe microscopy (TSPM) is a non-invasive technique that allows the detection of features below the surface of a sample, enhancing the contrast at the edges.

Excitation of a sample parallel to its surface, at the cantilever’s contact torsional resonant frequency, $f_{0CT}$, induces the torsional oscillation of the cantilever in contact with the sample.

Example of application, torsional APM allows the detection of in-plane defects such as delamination, edge dislocations or stacking faults, essential to detect in the semi-con industry where high epitaxial surface quality is essential in order to prevent adverse effects on device characteristics.

**RESULTS**

A stress field below the surface is induced due to the force applied by the tip.

The Physical contributions to lateral signal come from:

1) **Subsurface shear elasticity** → Conservative
2) **Friction** → Dissipation of energy

**SUMMARY**

TSPM is a promising non-invasive technique to obtain enhancement of boundaries or in-plane defects buried below a surface.

Torsional signal gives information of dissipation at the surface (friction) and the shear elastic properties below the surface (torsional subsurface).