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CHARACTERIZATION OF THE TIME-EVOLVING BENDING PROFILE OF MICRO-CANTILEVERS

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Introduction

• We present the statistical analysis of IBM style 8 cantilever sensors that are chemically functionalized for sensing specific biomolecules using a DVD-ROM optical drive [1].
• Several micromechanical-based sensing tools have been verified by their detection capabilities [2].
• In this work, we present new insight on the behavior of cantilevers made possible using a fully automated system for parallel microcantilever-based biosensing and statistical analysis of data [3].
• We are detecting an inflammatory biomarker, Soluble Urokinase Plasminogen Activator Receptor (suPAR).

Signal integrity verification

• The static response over time can be visualized and the quality of the cantilever surface assessed.
• The surface of cantilevers can be rather inhomogeneous and it varies from cantilever to cantilever.
• However, cantilever responses are “quite” stable over time, and this allows both for reliable data integrity verification, as well as estimating static response in case of missing cantilever readouts.

Conclusions

• It is a great advantage to collect a multitude of data points, as this enables more robust data processing.
• The approach can be used to automatically verify integrity of data.
• The approach prevents that the presence of anomalies or data loss leads to misleading conclusions.
• We believe that it is paramount that cantilevers are scanned in multiple areas in order to ensure sensor reliability.

REFERENCES