

3-D LASER SURFACE PROFILOMETRY

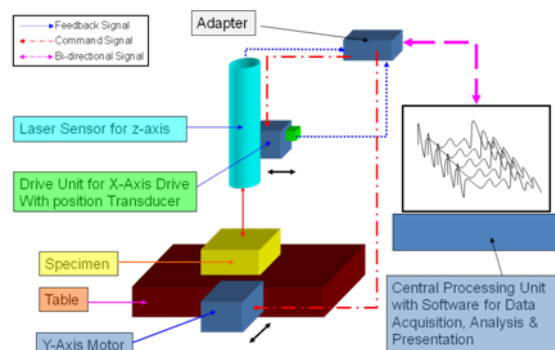
3D Laser Surface Profilometry (LSP) (Model: PGK120, MAHR, Germany) facility is established in 2003 at Department of Materials Science and Engineering with financial contribution from CARE grants of IIT Kanpur. This facility is currently installed in the Laboratory for Biomaterials.

LSP works on the principle of dynamic focusing of a laser beam and evaluation of the objective position. In particular, IR light (wavelength 780 nm) through guided objective is focused on the specimen surface. The reflected light is subsequently assessed by the objective and diverted to a focus detector. The moving position of the objective is converted to an electrical signal via a position transducer. The profile spacing position of the specimen in the Y-axis is controlled by a timed motor and the acquired signal is processed by commercial software.

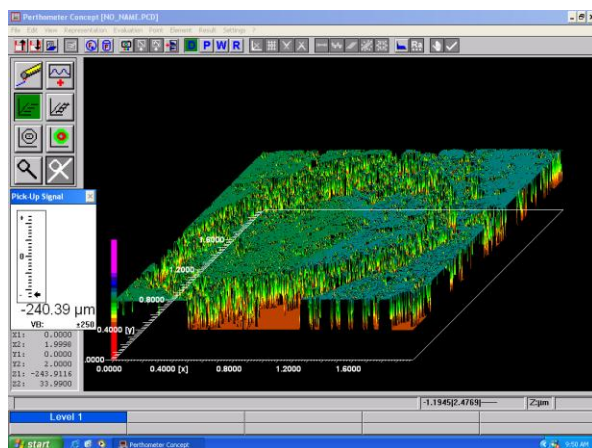
The applications include the analysis of wear scar area and depth, corrosion pit analysis, surface texture measurements etc. Spatial and vertical resolutions are $0.1\text{ }\mu\text{m}$ and 5 nm , respectively.



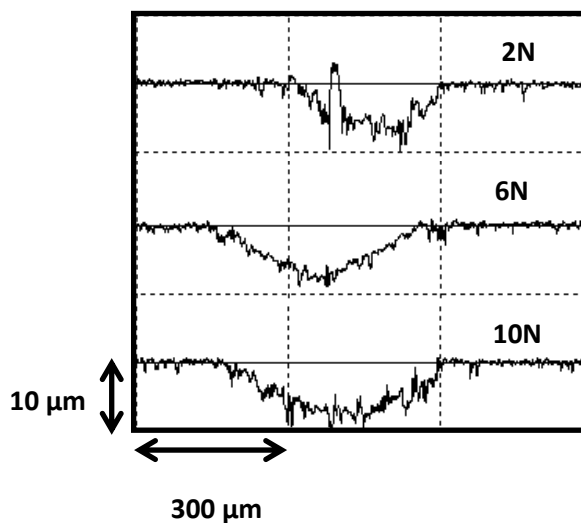
Laser Surface Profilometry facility



Schematic of process description



3D Topography of a Wear Scar



2D Profiles of Wear Scar at various load

Besides the users from other departments of IIT Kanpur, the facility is utilized by a number of research groups from various academic institutions/R&D laboratories, including IIT Madras, Jindal Stainless Steel Limited, Vikram Sarabhai Space Center, Trivandrum.

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