

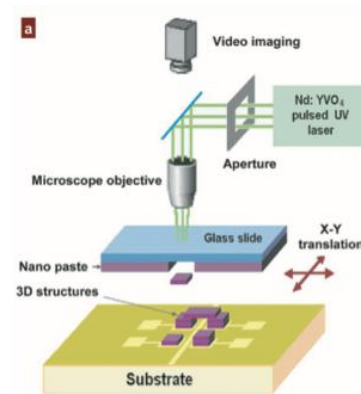
Master Thesis Work: Laser-induced material transfer

Background

Electronics underlies modern society and will continue to proliferate at an increased rate in a future that includes artificial intelligence, the internet of things et cetera. The accurate deposition of functional materials for the production of electronics is necessary to fulfill this promise. The ability to achieve volume and positioning accuracy and repeatability is of primary importance for the application. A technique that shows promise with respect to very minute depositions of complex fluids is laser-induced forward transfer, where a high intensity, short pulse laser is used to propel material onto a substrate.

Objective

The objective of the project is to utilise a pulsed laser system to probe the correlation between the quality of a deposit of complex rheological fluid (volume repeatability, positioning et cetera), laser pulse parameters (pulse length and intensity) and fluid properties (viscosity, material loading et cetera). The specifications concerning the fluid deposit with respect to volume and size will be based on contemporary high-end electronics and roadmaps for electronics production.



The project will include stages for literature review, design of experiment, design review, experiment preparation, measurements, and documentation.

Requirements

The work requires skill in the regimes of optics, fluid mechanics and experimental design. The project will also demand skill in the design of experiments, data collection and data analysis.

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