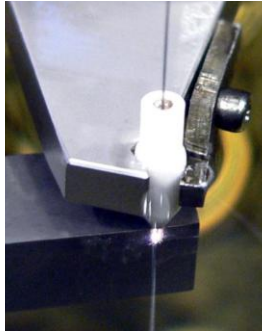
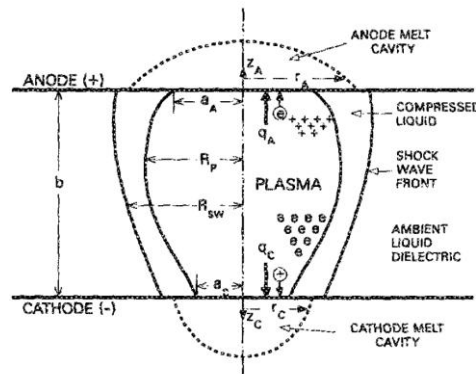


Master Thesis / Bachelor Thesis

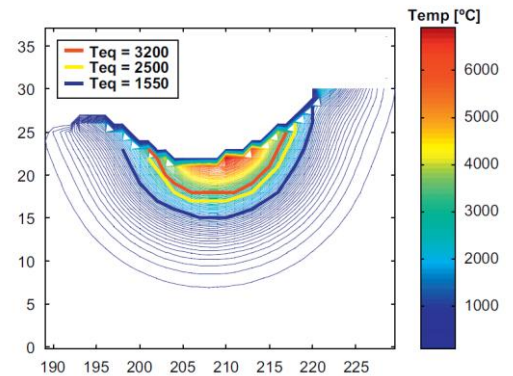
Mathematical modelling of Electric discharge in meso-micro EDM



**Meso-micro
EDM process**



**Analytical model of EDM
single discharge**



**FEM model of EDM using
multiple discharges**

Keywords: Mathematical modelling of physical process, Finite Element / Analytical modelling

Motivation

Several mathematical models have been proposed during last decades attempting to provide a simple model of the process which can be used for better understanding of the process on one side and predicting Material removal rate, tool wear and surface quality on other side for industrial application. However, a robust model (empirical, semi-empirical or analytical) still lacks which can explain various effects seen during EDM process especially in meso – micro scale machining (either due to surface area or applied energy per spark). This work relates to examine the existing analytical / FEM model of EDM process and simulate the results for meso-micro scale EDM for both research and industry.

Tasks

- Understanding basics of EDM process
- Literature survey of existing models and their comparison
- Programming existing analytical / FEM approach EDM process model
- Adapting model parameters to given experimental data
- Optimisation of model and data validation
- Summarise the results and documentation

Required skills

Motivation, interest in modelling and simulation

We offer

- Work in interdisciplinary team
- Acquiring physical process modelling skills (plasma physics, thermodynamics, Ansys / COMSOL)
- Close contact with the industry – AgieCharmilles SA, Physicists involved in the field of EDM, Plasma

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