
Master Thesis

Evaluation of Thermophoretic Processes in the Context of Flame-Wall-Interaction (FWI)

Thermophoretic processes include coupled transport of mass and energy in presence of temperature (respectively) concentration gradients (Soret and Dufour effects). Mathematically these are represented by additional diffusion terms appearing in the energy conservation equation. In turbulent combustion such contributions are generally deemed negligible and their importance, especially in homogeneous (gaseous) mixtures is not well understood. In the near-wall region however, where heat losses to cold walls play a fundamental role in flame-quenching processes and convective transport becomes less important, whilst diffusive effects are predominant, the simplification of the energy equation, where the Soret and Dufour effects are not accounted for might be inappropriate. The objective of the present Master thesis is to investigate the effects of thermophoretic transport in the context of Flame-Wall-Interaction (FWI) by means of numerical simulations which are to be validated against highly resolved experimental data.

Duration:

3 months

Requirements:

- Last year student in Engineering Science
- Good knowledge of mathematics and thermodynamics
- Good knowledge of the Fortran-programming language
- Strong interest in programming and numerical methods
- Familiarity with the Linux OS, Tecplot, Word and TeX
- Good command of English, spoken and written

Please send a complete application (in English or German) including a CV, a cover letter (limited to one page), transcripts and contact details to

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