

Les sprays

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Sprays in Engineering and the Environment

- ! **Sprays in Engineering (fuel injection, painting/coating, cleaning/cutting)**
- ! **Medical Sprays (drug delivery)**
- ! **Agricultural Sprays**
- ! **Fire Extinguishers**
- ! **Sprays in Nature (rain, fog)**

The main direction of work

- ! **Experimental studies of sprays (C.Crua)**
- ! *Development of theoretical and numerical models of cold sprays (S Martynov, E Sazhina, S Sazhin)*
- ! **Development of the models of droplet heating and evaporation (S Sazhin + research student)**
- ! **Building bridges with SMEs (S Sazhin, S Martynov)**

Spray Penetration



Development of the models of droplet heating and evaporation

- ! Development of the numerical code taking into account the temperature gradient inside droplets**
- ! Approximate analysis of thermal radiation absorption in droplets**

Dissemination of the Results

International conference presentations

- ! Sazhin S.S. **Multiple Scales in Spray Modelling**, *International Workshop on Multi-Scale Processes & Hysteresis*, University College Cork, Ireland, April 3-8, 2006 (invited lecture).
- ! Sazhin, S., Martynov, S., Crua, C., Sazhina, E., Heikal, M., Chtab, A., Gorokhovskii, M. and Katoshevski, D (2006) **Modelling of the dynamics and break-up of jets and sprays**. *The 6th Euromech Fluid Mechanics Conference*, KTH - Royal Institute of Technology, Stockholm 26-30 June 2006 (book of abstracts).
- ! Sazhin, S., Martynov, S., Shishkova, I., Crua, C., Karimi, K., Gorokhovski, M., Sazhina, E. and Heikal, M. (2006) **Modelling of droplet heating, evaporation and break-up: recent developments**. *International Heat Transfer Conference (IHTC-13)*, Sydney, Australia, 13-18 August, 2006.
- ! Martynov, S., Mason, D., Heikal, M, Sazhin, S. and Gorokhovski, M. (2006) **Modelling of cavitation flow in a nozzle and its effect on spray development**.

National conference presentations

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S. Sazhin, M. Heikal, C. Crua, S. Martynov, E. Sazhina, M. Gorokhovski, and A. Chtab

Poster at the INTERREG Showcase Event, 1 March, 2006, Ashford.

S. Martynov, D. Mason, Heikal and S. Sazhin

Poster presented at the UK national science week 2006. Annual Presentations by Britain Top Younger Scientists, Engineers and Technologists at the House of Commons, London, Monday 13 March 2006.

S. Martynov, S. Sazhin, and M. Heikal

Poster submitted to the BISME conference, KTP, September 10 – 12, 2006, University of Brighton.

Publications in International Refereed Journals

- ! **Sazhin, S.S., Kristyadi, T., Abdelghaffar, W.A. and Heikal, M.R. (2006) Models for fuel droplet heating and evaporation: comparative analysis, *Fuel*, v. 85(12-13), 1613-1630.**
- ! **Sazhin S.S. (2006) Advanced models of fuel droplet heating and evaporation, *Progress in Energy and Combustion Science*, v. 32(2), 162-214.**
- ! **Sazhin S.S. (2006) Multiple scales in spray modelling, *J Physics, Conference Series* (in press)**

Related Developments

- ! **Development of the dynamic decomposition method for numerical solution of the system of stiff ODEs (in collaboration with V Bykov, I Goldfarb, V**

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Thank you for your attention

Any comments or suggestions

would be highly appreciated

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