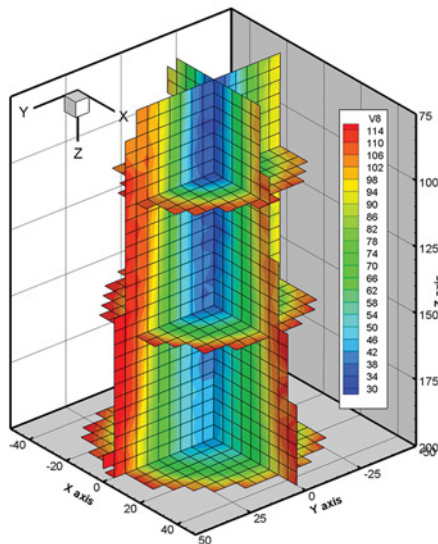


SPECIFICATION

- typical particle diameters range from 0.5 to 2000 μm
- single/two-component (1D/2D) velocity measurement ranging from -180 to 180 m/s
- measuring frequency up to 100,000 samples/sec
- typical measuring volume smaller than 1 mm^3
- high speed synchronous measurement of another 4 quantities along with PDA signals
- cyclic processes recording, measurement triggered by external event



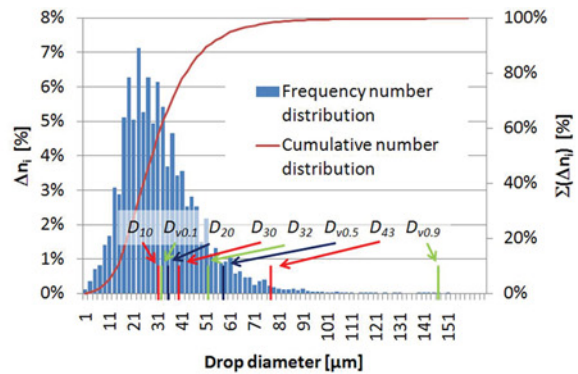
■ Sauter mean droplet diameter in spray

REFERENCES

- ERC GmbH Germany (Twin-fluid effervescent nozzle, combined three media atomizer for waste fuel combustion, pressure swirl nozzles of enhanced atomization characteristics for industrial burners, Effect of additives and nozzle wear on the Danfoss nozzle generated spray properties) (2003-2006)
- První brněnská strojírna Velká Bíteš, a.s., (Fuel atomizers for small scale turbine engines) (2011)
- První brněnská strojírna Třebíč, a.s., (Industrial burners of effervescent design for emission reduction) (2002-2005)

Phase-Doppler anemometer by Dantec Dynamics

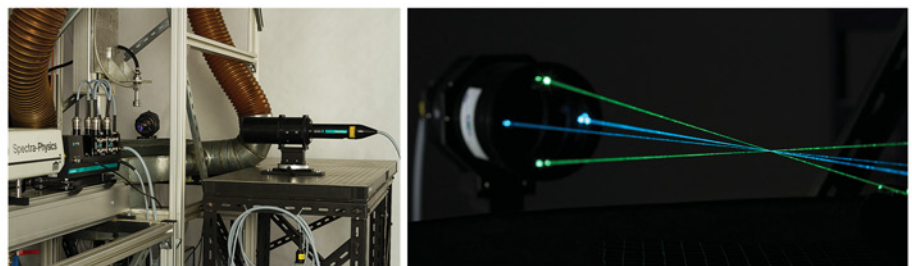
Phase-Doppler anemometry is a non-intrusive optical method for time and space resolved measurement in two-phase environment. It enables simultaneous measurement of size, velocity and detection time of individual particles (droplets, bubbles, seeding particles) based on light reflection and refraction within a small measuring volume. 2D phase-Doppler analyser by Dantec Dynamics is a Czech Republic unique laser diagnostic system of large variability of set-up that makes use of fibre optics and powerful 6W laser. It performs point-wise measurements. By sequential traversing in 2D or 3D, a complete picture of the investigated domain can be obtained. The results provide quantitative description of the flow and can be employed as the input data for numerical simulations.



■ Particle size spectrum

TYPICAL APPLICATIONS

- dense reacting/non-reacting sprays (car fuel injectors, pressure and twin-fluid nozzles of high flow rate of liquid e.g. for combustion chambers, desulphurisation plants, cooling sprays in metallurgy, suspension atomization, pharmaceutical industry, air humidification etc.)
- liquid aerosols generated with nebulizers, CMAG and VOAG generators
- studies of aerodynamics and hydrodynamics in free/unbounded environment and transparent models
- two-phase (liquid-gas) flow (bubble motion, bubble size)
- studies of fluid dynamics, turbulence, interaction of spray with surrounding fluid, mutual particle interaction
- frequency characteristics of flow and sprays, spray instabilities



PROVIDED RESULTS

- histograms of particle size, velocity and particle detection (transit) time
- arbitrary mutual correlations of those quantities with data filtering, calculation of derived quantities, concentration and mass flow rate estimates
- particle size and velocity statistics:
 - particle mean diameter (Sauter mean diameter or de Broucke diameter)
 - mean and rms velocity components, turbulence intensity

Ing. Jan Jedelský, Ph.D.

tel: +420 541 143 266 | e-mail: jedelsky@fme.vutbr.cz

Department of Thermodynamics and Environmental Engineering

Faculty of Mechanical Engineering, Brno University of Technology

Technická 2896/2, Brno 616 69, Czech Republic

tel: +420 541 143 280 | e-mail: otp@fme.vutbr.cz | www.eu.fme.vutbr.cz