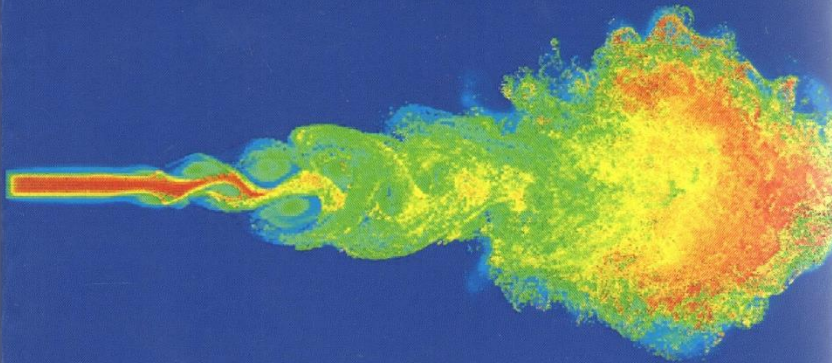


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**NUMERICAL SIMULATION OF  
AERODYNAMIC AND THERMAL  
CHARACTERISTICS OF  
PULVERIZED FUEL**



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The physical and mathematical model used in the monograph, which gives a rigorous description of the main processes of heat and mass transfer in combustion chambers, and the method of constructing a geometric model of a real combustion chamber in combination with modern computing technologies, using capabilities of modern supercomputers, enable us to carry out a comprehensive study of all characteristics of the solid fuel combustion process in a rather short period of time.

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**SYMBOLS AND ABBREVIATIONS**

$V$  – volume,  $m^3$   
 $\rho$  – density,  $kg/m^3$   
 $S$  – source member  
 $\phi$   
 $p$  – pressure, Pa  
 $\tau_{ij}$  – viscous stress tensor  
 $x, y, z$  – coordinates  
 $\phi$  – generalized transport variable  
 $\Gamma$  – generalized exchange coefficient  
 $\phi$   
 $\delta_{ij}$  – Kronecker symbol  
 $m$  – mass, kg  
 $T$  – temperature,  $^{\circ}C(K)$   
 $h$  – specific enthalpy,  $kJ/kg$   
 $k$  – kinetic energy of turbulence,  $m^2/s^2$   
 $K_{abs}$  – optical absorption coefficient,  $1/m$   
 $D$  – diffusion coefficient,  $m^2/s$   
 $\epsilon$  – the rate of dissipation of turbulent kinetic energy,  $m^2/s^3$   
 $\mu$  – dynamic viscosity,  $kg/m \cdot s$   
 $C_{\mu}, C_{\epsilon 2}, C_{\epsilon 1}$  – empirical constants of the turbulence model  
 $\sigma$  – stoichiometry coefficient  
 $d$  – particle diameter (m)  
 $E_a$  – activation energy (J / mol)  
 $k_d$  – diffusion coefficient  
 $k_c$  – chemical velocity coefficient  
 $S_{ext}$  – total external surface per unit mass of the coke particle,  $m^2$   
 $Q_{chem}$  – energy released in a chemical reaction  
 $I_w$  – intensity of radiation,  $kW/m^2 \cdot rad$   
 $\Omega$  – solid angle, rad  
 $\theta$  – flat angle, degree  
Pr – Prandtl number  
Ma – Mach number