The methodological aspects covering the development of mathematical models of metal particles combustion in air

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The article deals with the combined computational and experimental approach for clarifying the empirical constants in the combustion law of the particles of powdered metal fuel (PMF). A possibility of the method usage is demonstrated on modelling of flame front propagation in a constant volume experimental stand. The paper considers a design of the experimental stand and the methodology of the experiment. It also describes mathematical model used. A comparison of the calculated and experimental values of the flame front speed for PMF gas suspensions is included. The possibility of applying this combined computational and experimental approach to clarify the physical and mathematical models to describe the ignition and combustion of two-phase reactive gas dynamic flows is shown.

Keywords: *mathematical modeling, experimental research, metal particles combustion, flame front, combustion chamber, combustion law*

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