

Experimental studies of aerodynamic characteristics of thin conical and cylindrical shells in a subsonic flow

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The paper focuses on the experimental studies of aerodynamic characteristics of thin circular and split shells of conical and cylindrical shapes in a subsonic incompressible gas flow. Know aerodynamic characteristics is crucial to reliably determine the size of the impact zones of exhaust structure members when launching rocket vehicles. First, the graphs of the aerodynamic characteristics dependence on the angle of attack were plotted and the features of the gas flow past the thin shells were revealed. Then, the influence of the opening angle of the shells on the aerodynamic characteristics was determined. By numerical simulation it was possible to visualize the gas flow past the shells, and consider their transformation with a change in the shape and angle of attack. Finally, the comparison between the change in flow patterns and that in aerodynamic characteristics depending on the angle of attack was made.

Keywords: aerodynamic characteristics, rocket vehicle, separable elements, cylindrical shells, conical shells, wind tunnel, subsonic flow, angle of attack

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