Impact of dissipative properties on solid propellant rocket engine systems

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The paper presents a structural analysis of the developmental changes in dissipation processes occurred in critical structural elements of the solid propellant rocket engine (SPRE) under the conditions of resonant or rear-resonant internal wave interactions. This interaction results in amplifying a vibration amplitude of the gas due to energy redistribution in the structural elements of the SPRE. The process causes some changes in internal volume of the SPRE combustor. Amplitude of the pressure vibrations also amplifies inside the SPRE combustor. It is necessary to analyze the changes of energy dissipation occurred in the structural elements of the SPRE combustor in order to prevent an engine failure during its operation.

Keywords: *solid-fuel rocket engine, pitching acoustic instability, combustor, dynamic amplification factor, energy dissipation*

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