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Abstract

High frequency instability is an on going danger to the successful operation and development of new liquid propellant rocket engines. The highly destructive nature of high frequency instability can result in safety risks and costly delays in engine development programs. Further understanding of the mechanisms and parameters that affect combustion stability can be used to further limit these dangers. The rectangular combustor designated ‘BKH’ was developed to study flame-acoustic interaction under forced excitation for both sub and super critical conditions. This paper presents a preliminary parametric study undertaken during run in testing of the new ‘BKH’ hardware. The focus is on the affects of oxidizer to fuel ratio and velocity ratio on the roughness of combustion for warm GH2 at sub and super critical pressures. It was found that higher injection velocity ratio increased the energy content of high frequency acoustic energy for warm GH2 and that higher oxidizer to fuel ratio produced less combustion roughness. This trend is inconsistent with observations presented by Wanhainen et al (1966).