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Abstract

An injector that realizes the required drop size and drop size distribution is one of the conditions for obtaining good performances in a rocket combustor. In this publication results of the basic research activities conducted at DLR in the last few years on the spray behavior of impinging jet injectors are summarized, with particular focus drop size measurements. A modular doublet like-on-like impinging jet injector setup has been used and various Newtonian and non-Newtonian fluids have been investigated under ambient conditions with injection velocities up to 80 m/s. The large amounts of Newtonian liquids tested allowed covering a very wide range of Ohnesorge numbers. In studying non-Newtonian fluids the spray behavior of gels has been compared to that of their corresponding pure solvents. Also the influence of the addition of aluminum particles to gels has been studied. Finally an overview on recent studies focused on the understanding of the formation of thread like structures instead of droplets is given when certain non-Newtonian fluids are used.