

Postprint: Emission Characteristics of Engine Exhaust Cooling with Low Ejector Ratio in Climate Laboratory

Authors: Zhang Bo

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Abstract

To investigate the influencing factors and laws governing small entrainment ratio cooling emissions from engine exhaust during operation in a climate laboratory, a typical low bypass ratio engine was taken as the research object. Using numerical simulation methods and considering engine exhaust composition as well as variable specific heat fluid properties, the effects of exhaust pipe diameter, pipe inlet distance, and water spray cooling on the small entrainment ratio emission characteristics of engine exhaust were analyzed. The results show that: the entrainment ratio exhibits a linear positive correlation with exhaust pipe diameter, increasing with increasing pipe diameter; pipe inlet distance has a minor influence on the entrainment ratio, but an optimal pipe inlet distance exists; water spray cooling disrupts the shock wave structure of the ejector flow field, reduces the velocity deficit of the exhaust jet, and increases the entrainment ratio.

Full Text

Preamble

The source material provided for translation exhibits severe corruption characteristic of PDF extraction failures. Our analysis indicates that the document contains extensive artifacts, including but not limited to fragmented character sequences, misplaced formatting tokens, and irrecoverable text encoding errors. These deficiencies render the substantive content non-extractable with confidence.

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through standard preprocessing methods. Without access to a clean version of the source document, a faithful translation cannot be produced.

This statement serves to document the data quality issues encountered and explains the absence of a translated manuscript. We recommend obtaining the source material in a more stable format (e.g., native LaTeX source, Word document, or a high-quality PDF without compression artifacts) to enable proper translation.

Note: Figure translations are in progress. See original paper for figures.

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