第５号様式

論文審査の要旨

博士の専攻分野の名称	博　士　（　　工学　　）	氏名	楊　康
学位授与の要件	学位規則第４条第[1]・２項該当		

論　文　題　目

Effects of Piston Cavity Impingement and Split Injection on Mixture Formation and Combustion Processes of Diesel Spray

（ディーゼル噴霧のピストンキャビティ衝突と分割噴射が混合気形成及び燃焼過程に及ぼす影響）

論文審査担当者

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〔論文審査の要旨〕

The objective of this work is to obtain an enhanced understanding of the effect of split injection on mixture formation and combustion processes of free spray and 2-D cavity impingement spray. Three kinds of injection amounts (0.27 mg, 0.89 mg, 2.97 mg) were adopted to investigate the effect of small injection amount on the mixture formation and combustion processes of free spray. For the split injection, the injection process comprised a pre-injection followed by the main injection. The main injection was carried out either as a single injection of injection pressure 100 MPa (Pre + S100), 160 MPa (Pre + S160) or split injection of injection pressure 160 MPa itself was either of two types defined by mass fraction ratios 50：50 and 75：25 (Pre + D160_50-50, Pre + D160_75-25). S100 and D160_75-25 strategies were also compared with Pre + S100 and Pre + D160_75-25 to check the effect of pre-injection on the combustion process under 2-D cavity impingement spray. Low oxygen concentration (15% O2) was also taken into account in the 2-D cavity under split injection strategy.

Chapter 1 presents the free spray and impinging spray characteristics and shows the optical diagnostic techniques for spray and combustion.

Chapter 2 describes the experimental apparatus such as fuel injection system and constant volume vessel, and the observation techniques adopted in this work such as Mie scattering method, Laser Absorption Scattering technique, Natural luminosity recording system, Two-Color method and OH* chemiluminescence technique.

Chapter 3 illuminates the effect of small injection amount on Diesel spray mixture formation and combustion characteristics. The results reveal that small injection can enhance the fuel evaporation process and decrease the soot emissions.

Chapter 4 analyzes the effect of split injection on mixture formation and combustion processes of diesel free spray and found that split injection decreases the soot emissions.

Chapter 5 analyzes the effect of split injection on mixture formation and combustion processes of 2-D cavity impingement diesel spray.

Chapter 6 compares the free spray and 2-D cavity impingement spray under same split injection strategies.

Chapter 7 clarifies the influence of low oxygen concentration on the diesel combustion characteristics and investigates the effects of pre-injection on the combustion processes.

Chapter 8 makes the conclusions on mixture formation and combustion processes of diesel free spray and 2-D cavity impinging spray.

以上，審査の結果，本論文の著者は博士（工学）の学位を授与される十分な資格があるものと認められる。

備考：審査の要旨は，1,500 字以内とする。