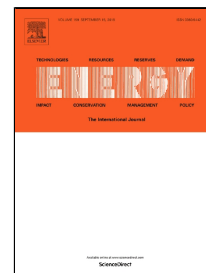


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Effect of internal exhaust gas recirculation on the combustion characteristics of gasoline compression ignition engine under low to idle conditions

Lei Zhou, Jianxiong Hua, Feng Liu, Fengnian Liu, Dengquan Feng, Haiqiao Wei



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1 **Effect of internal exhaust gas recirculation on the combustion characteristics of gasoline**
2 **compression ignition engine under low to idle conditions**

3 Lei Zhou[#], Jianxiong Hua[#], Feng Liu, Fengnian Liu, Dengquan Feng, Haiqiao Wei^{*}

4 State Key Laboratory of Engines, Tianjin University, Tianjin 300072, China

5
6 ^{*}Corresponding author: Haiqiao Wei

7 Address: 92 Weijin Road, Nankai District, Tianjin, P. R. China

8 Tel.: +86-22-27402609

9 [#]These authors contributed equally to this work and should be considered co-first authors

10 Email: whq@tju.edu.cn

11
12 **Abstract**

13 Internal exhaust gas recirculation (iEGR) is one of the effective methods to improve combustion
14 stability of gasoline compression ignition (GCI) engine under low load conditions. However, the
15 heating effect to the ambient gas, the dilution effect to O₂ concentration, and the changing of heat
16 capacity, which are caused by introducing iEGR into cylinder, have complicated influences on
17 combustion process. The present work comprehensively investigates the competitive relationship
18 between heating effect and dilution & heat capacity effect on combustion characteristics in GCI engine
19 under different engine loads. Under low load conditions, there is a competitive relationship between
20 heating effect and dilute & heat capacity effect of iEGR on start of combustion (SoC) and burning rate.
21 The burning rate firstly rises and then decreases as iEGR ratio increases from low to high due to the
22 competitive relationship. However, the SoC is controlled by both fuel distribution and the competitive

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