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AN EXPERIMENTAL ANALYZE HOMOGENOUS CHARGE COMPRESSION IGNITION (HCCI) ENGINE IN PRE-MIXED CHARGE COMPRESSION IGNITION (PCCI) MODE OPERATING AT DIFFERENT FUEL CONDITIONS USING PETROL

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Abstract

In this experiment we optimize the performance and emission characteristics of Homogenous charge compression ignition (HCCI) engine operating in *premixed charge compression ignition* (PCCI) mode assisted with a secondary pilot injector as combustion initiator (HCCI) in the inlet manifold. HCCI is a clean and efficient combustion process. HCCI has advantages in high thermal efficiency and low emissions and possibly become a promising combustion method in internal combustion engines. In this experiment with petrol we use diesel and bio-diesel (jatropha) at different mixing ratios to test the performance and emission characteristics in HCCI engine. The engine used for the experiment is single cylinder water-cooled diesel engine (agricultural type) employing our conceptual system known as *transient state fuel induction*. The observations are proved to have increased in brake thermal efficiency with reduced emissions. Variable valve actuation (VVA) has been proven to extend the HCCI operating region by giving finer control over the temperature-pressure-time history within the combustion chamber.

Keywords: homogeneous charge compression ignition (HCCI), premixed charge compression ignition (PCCI), pilot injection