

Abstract

The use of natural gas in compression ignition engines as supplement to liquid diesel in a dual fuel combustion mode is a promising technique. In this study, the effect of DF (dual fuel) operating mode on combustion characteristics, engine performances and pollutants emissions of an existing diesel engine using natural gas as primary fuel and neat diesel as pilot fuel, has been examined. At moderate and relatively high loads, the results show very interesting behavior of dual fuel operating mode in comparison to conventional diesel, both for engine performance and emissions. It showed a simultaneous reduction of soot and NO_x species over a large engine operating area. Moreover, it showed the possibility to obtain lower BSFC (brake specific fuel consumption) than conventional diesel engine. However, this mode presents some deficits at low loads, especially concerning unburned hydrocarbons and carbon monoxide emissions. Understanding those deficiencies is a key of such engines improvement. Some suggestions for new measures towards DF mode improvement are deduced