عنوان مقاله:

Three-Dimensional Modeling of Combustion Process and Soot and NOx formation In a Direct-injection Diesel Engine

محل انتشار:

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نویسندگان:

Samad Jafarmadar - *Assistant professor of mechanical Eng., Urmia University*

Ramin Barzegar - *Undergraduate student of mechanical Eng., Urmia University*

Sina Shafee - *Undergraduate student of mechanical Eng., Urmia University*

خلاصه مقاله:

This paper is presented to study the combustion process and emissions in a direct-injection Diesel engine. Computations are carried out using a three-dimensional model for flows, sprays and combustion in Diesel engines. Interactions between combustion and emissions with flow field are considered here and it is shown that soot mass fraction is reduced at regions with low turbulence intensity and Air Fuel Ratio (AFR). Spray droplet breakup and distribution is modeled by advanced Wave Standard in which initial droplets have the diameter of nozzle orifice. Combustion process is predicted by Eddy Breakup model which is a turbulent controlled combustion model. NOx formation is modeled by the Zeldovich mechanism while, Soot is modeled by the Kennedy, Hiroyasu and Magnussen mechanism. Also, at this model, impingement of spray with the piston walls was being studied and seen that soot mass fraction reaches the maximum amount at impinging zones. Behavior of the predicted results from this three dimensional model shows a good agreement with the corresponding data in the literature.

کلمات کلیدی:

Diesel Engine, turbulent, combustion, spray, emission