

REDUCING DIESEL ENGINE EMISSIONS**C.M. Lyons, D.J. Timoney***Department of Mechanical Engineering, University College Dublin, Dublin, Ireland*

Diesel engine exhaust emissions, particularly oxides of nitrogen (NO_x) and of Particulate Matter (PM), have wide-ranging detrimental effects on ecosystems, buildings and human health. Their control will be critical in order to alleviate the future pressures on the global environment. Many diesel emission control strategies have been implemented in the last twenty years, with the result that the emissions levels from diesel passenger vehicles have been reduced by 80-90%. However, there is still much work to do in order to meet the proposed EU and US-EPA legislative limits. One of the factors currently limiting the effectiveness of exhaust emissions reduction technologies arises from the poor transient response characteristics of existing on-board exhaust gas NO_x sensors. This limits their use in feedback control strategies. The work described in this poster shows a means of overcoming this limitation using an indirect approach, based on measurement of instantaneous cylinder pressures and on implementation of simplified combustion models for NO_x and PM prediction. These models employ some empiricism but are based on fundamentals of chemistry and Thermodynamics. Computational time is kept low and it is envisaged that these could find application as a substitute for fast response NO_x sensing system in low emissions diesel engines of the future.