

# 講演会のご案内

## Model based Control strategy of new air system for engines

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**ABSTRACT:** For modern boosted engines, the electrically assisted turbocharger (eTurbo) can enhance the transient boost response and reduces the pumping loss in assist mode, while recuperates the excess exhaust energy using the regeneration function. For control design for air system with eTurbo, a high fidelity model was developed for improved compressor and turbine performance prediction, since eTurbo allows the turbocharger (TC) operation outside the nominally mapped regions. A model predictive controller is developed to achieve improved TC performance with minimal pumping losses, while meeting air path requirements on fresh air and EGR flow rates. An extended state observer is used in conjunction with MPC for Results confirm the effectiveness the proposed control design and also illustrate engine performance benefits from eTurbo system, in terms of transient response and fuel economy relative to a conventionally boosted system.



### BIOGRAPHY OF HUI XIE

Prof. Hui Xie received his PhD in propulsion machine and engineering at Tianjin University in 1998, and now he holds a position as professor and vice director in State Key Laboratory of Engines at Tianjin University, also as director in Tianjin University-Infineon Automotive Electronics Joint Lab. His research topics are control technology for combustion process on ICE, theories and methods for control of gasoline HCCI/CAI engines, software and hardware for electronic control of engine and vehicle, calibration method and technology for electronic control system, and control of engine and vehicle, calibration method and technology for electric system, and control of EV and HEV. Prof. Hui Xie was and is in charge of about 40 R&D projects from government and industry on control of engine and vehicle. He published about 60 scientific publications within engine and vehicle field, and got Awards of the second Scientific Development Award from China Ministry of Education in 1998 and 2009, the second Science and Technology Development Award of Tianjin in 2001 and 2008, the Second National Technology Invention Award in 2010.

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