



Two Conferences One Goal

6. International Conference
Ignition Systems for SI Engines

7. International Conference
Knocking in SI Engines

Berlin, September 17 – 18, 2024
Akademie der Wissenschaften

Program Day 1 – 17.09.2024

08:45 Welcome
Marc Sens, IAV GmbH

09:00 Keynote Speech I
Dr. Amer Ahmad Amer, Aramco

Ignition System Fundamentals

09:30 Software-features for optimization of ignition timing
Sascha Gerhardt, Robert Bosch GmbH

10:00 AI-based detection of semi-surface discharge and ceramic punctures in a spark plug test rig
Dr. Metin Korkmaz, Tenneco GmbH

10:30 Coffee Break

Pre Chamber Fundamentals I

11:00 On the origin of pre-ignition inside a pre-chamber spark plug – gas analysis
Moritz Grüninger, Karlsruhe Institute of Technology

11:30 Overview of current developments of pre-chamber spark plugs for passenger car applications
Dr. Metin Korkmaz, Tenneco GmbH

12:00 Pre-chamber ignition and the challenges for knock detection
Timo Rehm, Robert Bosch GmbH

12:30 Lunch Break

Hydrogen ICE Ignition Systems

14:00 Development of ignition systems for hydrogen-powered internal combustion engines
Maxime Chendelier, Tenneco/Champion

14:30 Robust Ignition and Sparkplug Wear for H2 SI-ICE
Dr. Jakob Ängeby, SEM AB

15:00 Smart ignition coil diagnostic system for H2 ICE combustion detection
Stefano Papi, Tenneco GmbH

15:30 Coffee Break

Pre Chamber Fundamentals II

16:00 Consideration of the relationship between flame formation and fast combustion in the second half of the combustion phase of pre-chamber jet combustion
Shiina Ryosuke, Honda R&D Co., Ltd.

16:30 3D CFD modelling of TJI combustion achieved by active or passive pre-chamber
Alessandro Nodi, Politecnico di Milano

17:00 Assessment of passive TJI technology on a mild hybrid powertrain and its performance on cold operating conditions
Dimitrios Karageorgiou, Aramco Fuel Research Center

17:30 End of day 1
Marc Sens, IAV GmbH

19:00 Evening Event

Program Day 2 – 18.09.2024

08:50 Welcome into 2. Day
Marc Sens, IAV GmbH

09:00 Keynote Speech II
Dr. Kelly Senecal, Convergent Science

Pre Chamber Alternative Fuels

09:30 Virtual analysis of the efficiency gain with pre-chamber combustion systems in heavy-duty natural gas engine for long-haul truck application
Dr. Dario Di Maio, CNR-STEMS

10:00 Design optimization of a CNG-single-cylinder engine for lean mixture operation via active pre-chamber system: numerical investigation and experimental validation
Dr. Antonino Vacca, FKFS

10:30 Integrative insights from the FUELCOM3 project on pre-chamber-based ignition systems for advanced combustion engines
Dr. Emre Cenker, Saudi Aramco Research and Development Center

11:00 Coffee Break

Irregular Combustion Fundamentals

11:30 Assessment of pre-ignition phenomena by thermodynamically approach
Dr. Thomas Emmrich, IAV GmbH

12:00 A fundamental investigation of oil additives on pre-ignition in a high pressure combustion chamber
Jan Reimer, Karlsruher Institut für Technologie, Institut für Kolbenmaschinen

12:30 Simulating fuel ignition and combustion in IC engines with Lagrangian-Eulerian Spark-Ignition (LESI) model and detailed chemistry
Dr. Josep Gómez Soriano, CMT – Clean Mobility & Thermofluids

13:00 Lunch Break

Hydrogen Combustion Fundamentals

14:00 Modeling the impact of mixture formation on ignition and flame propagation in a hydrogen direct-injection engine
Dr. Riccardo Scarcelli, Argonne National Laboratory

14:30 Determining the transition from auto-ignition to knock in methanol operation by application of the Bradley Theory
Philipp Hermsen, Chair of Thermodynamics of Mobile Energy, RWTH Aachen

15:00 Observations on pre-ignition in a port injected heavy duty hydrogen internal combustion engine
Dr. Thomas E. Briggs, Southwest Research Institute Powertrain Engineering Division

15:30 Higher efficiency through model-based, predictive knock control
Dr. Michael Fischer, Tenneco GmbH

16:00 Closing Words by IAV, Advisory Board

16:15 End of Conference