

Exhibition and Poster Sessions

The technical exhibition and poster session during SETC2017 will offer a great opportunity for participants to network with colleagues and to explore the latest products and services on small engine industry. Also poster session will promote the engineering exchange and mutual understanding between academia and industries.

Exhibition & Poster Session Hours

*Wednesday, November 15, 2017,
10:00-17:00*

*Thursday, November 16, 2017,
10:00-17:00*

*Friday, November 17, 2017,
10:00-12:00*

No.	Company
1	SCSK Corporation
2	Umicore Auto Cat Pvt. Ltd
3	Sedemac Mechatronic Pvt. Ltd.
4	EXEDY Corporation
5	Keihin Corporation
6	Infineum UK. Ltd.
7	MAHLE Japan Ltd.
8	Schrader International
9	Honda R&D Co., Ltd.
10	Kawasaki Heavy Industries Ltd.
11	TPR Co., Ltd
12	Kubota Corporation
13	SUZUKI MOTOR CORPORATION
14	AVL SEA & Australia Co. Ltd
15	Yamaha Motor Co., Ltd.
16	Pricol Surya Indonesia
17	Direktorat Jendral IKM Kementerian Perindustrian
18	PT Pertamina (Persero)

Poster Sessions for Challenging Exploratory Study

- 1. BASF Catalyst** **Xinzhu Ryan Liu Nov. 15**
PGM Oxidation State Control to Balance CO and HC Reaction for Small Engine Catalyst Design
- 2. BASF Performance Materials Asia Pacific** **Michael Sun Nov. 15**
High-Performance, Long-Chain Polyphthalamide (PPA) by BASF

Poster Sessions for Academia

- 1. Graduate School, Nihon University** **Yusuke Miyauchi Nov. 15**
Influence of Spatial Distribution of Ozone by Local Non-Equilibrium Plasma Discharge on Pressure Rise Rate of HCCI
Normal-heptane / oxygen / nitrogen premixed gas was spontaneously ignited by using SRCM. Ozone distribution generated by dielectric barrier discharge was investigated using an image spectrometry about 253.7 nm. As a result, pressure rise rate can be reduced by local non-equilibrium plasma discharge. It may be related to spatial distribution of ozone.
- 2. National Taipei University of Technology** **Jyun-Wei Chen and Sin-Jie Ciou Nov. 15**
Designing Stratified Combustion System for Gasoline Direct Injection Engine by CFD Software
Gasoline direct injection (GDI) engine is future development trend, and the key energy-saving technology is stratified combustion. It can be found from different injection timing result that setting injection timing in intake stroke is for supplying homogenous mixture, and the local rich mixture can be produced with injecting before top dead center in compression stroke (bTDC). Finally, in different boost pressure and IVO timing simulation condition, the flow rotational center of flow field is significant in compression stroke before top dead center (bTDC). If the injection timing is coordinated, the rich mixture will be gathered in position of spark plug center.
- 3. Tokyo City University** **Daijiro Ishii Nov. 15**
Instantaneous surface Temperature Measurement in Internal Combustion Engine Using Newly Developed Coaxial Type Thin-film Temperature Sensor
In this poster, structure and measurement example of newly developed sensor which was developed by the authors, and the configuration of measurement system of the sensor response evaluation device are reported.
- 4. National Taipei University of Technology** **Yu-Tang Wang Nov. 15**
Applying EGR System in Turbo-Charged Engine
An EGR engine simulation is preliminarily studied with Ricardo WAVE software, and the engine experiment is then carried out. The effects on fuel consumption and pollution brought by different ratio of the proposed EGR system, which is calculated using CO₂ ratio, is investigated. The results show lower fuel consumption can be achieved due to the reduction of pumping loss under low percentage of EGR ratio. And the pollution of CO, HC and NO gradually reduces with increased EGR ratio under both 2400 rpm and 2800 rpm part load conditions. When it goes to heavy load under 2800 rpm, CO and HC go up because the stock ECU (Engine Control Unit) commands richer air fuel ratio when the EGR ratio increases.

5. Hiroshima City University **Yoshihiro Aramaki Nov. 15****Parallel Active Control of Acceleration Noise**

Active Noise Control (ANC) is noise cancellation method which is effective for low-frequency engine noise. However, it is difficult to control engine noise under acceleration condition because of it fluctuates intensely. Therefore, we tried to improve the ANC to control engine noise during acceleration.

6. Graduate School of Information Science, Hiroshima City University **Prof. Sunsuke Ishimitsu Nov. 15****Active Sound Quality Control Adapted to Individual Preference**

We proposed the engine sound control system according to the preference of each subject. In this study, we categorized each participant by driving pattern. From the categorization, we performed auditory tests and determined the sound by individual preference. As a result, we produced the Active Sound Quality Control system, which allows automatic generation of the preferred sound quality of each individual.

7. Graduate School of Information Science, Hiroshima City University **Prof. Sunsuke Ishimitsu Nov. 15****Objective Annoyance Evaluation using Biological Signals**

We extracted features of pain using the wavelet transform and the ratio between low and high frequency components (LF/HF). We proposed a new wavelet analysis focused on mutualsimilarity of biological signals using the mother wavelet of EEG. When the painful stimulus was applied, the feature obtained by the alpha wave band in EEG was attenuated.

8. Graduate School of Natural Science and Technology, Kanazawa University **Yoshihide Ota Nov. 16****Effect of heat flux on fuel droplet evaporation behavior in high temperature condition**

In this study, fuel droplet of approximately 20 μ m diameter is injected by experimental apparatus. After that, droplet goes to butane flame. We observed it by high-speed camera, and considered the effects of heat flux on the kerosene and diesel oil droplet evaporation and breakup phenomenon. It is found that the breakup diameter is not dependent on heat flux.

9. Graduate School of Natural Science and Technology, Kanazawa University **Takuya Mino Nov. 16****Temperature Measurement of Microscopic Supercritical Atmosphere**

In our study, a fuel droplet of approximately 30 μ m diameter is injected into supercritical atmosphere. It's important to specify the atmosphere condition. So we measured the temperature distribution using self-made 14 μ m thermocouple. And the accuracy of the supercritical atmosphere was verified.

10. National Taiwan University of Science and Technology **Anton Halim Nov. 16****Dynamic Modeling of a Diesel Oxidation Catalyst and Diesel Particulate Filter Aftertreatment System for Regeneration Control Development**

Establish a physics-based dynamic modelling of DOC and DPF, which able to capture regeneration process achieved either by passively use of a catalyst or by actively introducing high heat into the exhaust system to burn accumulated soot. DOC/DPF model was being validated and had a good agreement with actual experimental data.

11. Graduate School, Nihon University **Hikaru Yamada Nov. 16****An Effect of Bio Fuel for Low Compression Ratio Diesel Engine**

The purpose of this study is to explore an effect of the coconut oil methyl ester (CME) and vegetable oil methyl ester (VME) on a low compression ratio diesel engine performance. The engine performance was measured in the steady operating condition at 3600 rpm of engine speed.

12. Natural Science and Technology, Kanazawa University

Rizqi Fitri Naryanto Nov. 16

Numerical Simulation with Discrete Phase Model of Fixed Bed Reactor for a Small Combustion Engine

This poster presents modeling of biomass gasification in a fixed bed reactor with Computational Fluid Dynamics (CFD) using Discrete Phase Model (DPM). Recently, Biomass usage in Indonesia revealed increasing trend in utilization. Applied Combustion Laboratory in Kanazawa University had also been established on experimental and numerical simulation on Biomass gasification. In presented model, biomass is treated as a porous material consisting of a solid matrix and interconnected with a fluid. It can be considered as a two phase flow where fluid (air) interacts mechanically, thermally and sometimes chemically with solid matrix of porous media which may deform due to these interactions. The CFD code ANSYS FLUENT was used to simulate and solve the problem.

13. Hiroshima institute of technology

Kentaro Takatani Nov. 16

Effects of Ion-Probe Insulator Material on Measuring Properties of Propagating Flame in 2-Stroke Gasoline Engine

Our group has applied multiple ion-probes method on 2-stroke gasoline engine. One of the present issues is deterioration of electric insulation on ion-probe for longer engine operation duration. The present poster reports the effects of insulator material for measuring properties of propagating flame in the engine.

14. Universitas Sebelas Maret

Herman Saputro Nov. 16

Mathematics modeling of Flame-spread Behavior Based on Percolation Theory and Microgravity Experiment of Droplet Array

It is difficult to conduct the experiment on large-scale droplet cloud combustion because the buoyancy effect is significant in normal gravity. This research presents the numerical simulation of 2-dimensional (2D) and 3-dimensional (3D) flame-spread behavior in large scale of droplet cloud without and with consideration of the interaction of two-droplets. The numerical simulation was calculated based on flame-spread characteristics of droplet array in microgravity, using percolation approach and considering the flame-spread-limit distance (S/d_0) limit. The results show that the interaction effects of two-droplet in randomly distributed droplet cloud have influence on the probability of group combustion (OPGC) and critical point of flame-spread.

15. Atma Jaya Catholic University of Indonesia

A. Wahyudi, M. Dylan, A. Soewono Nov. 17

Design of Test Bench for Motorcycle Engine with Carburetor System

Otto engine is the most widely used engine in small vehicle such as motorcycle and hence, significant efforts have been done in order to improve the engine performance via engine testing. The purpose of this research is to develop an engine test bench for a motorcycle engine that is capable of measuring volumetric efficiency and engine power loss simultaneously and independently. The proposed engine test bench takes advantage of experience learnt from past studies in order to obtain more accurate engine power and emission.

16. Atma Jaya Catholic University of Indonesia

R. Bayu, B. Kristianto, I. Iskandar Nov. 17

An Experimental Study of LPG as a Fuel for Motorcycle Engine

Motorcycles are one of the most popular of transportation methods being used in Indonesia. These motorcycles are usually powered by regular grade gasoline called premium. However, the supply of premium is recently reduced by government policy. Hence, research on alternative fuel in transportation sector has become priority. In this study, Liquefied Petroleum Gas (LPG) is used as a substitute fuel on a motorcycle with carburetor system. The engine performance, fuel consumption, and exhaust gas emissions are being carefully investigated.

- 17. Atma Jaya Catholic University of Indonesia** **A. Setiawan, Pryawrata P., M. Darmawan Nov. 17**
The Effect of Fuel Injection Timing on the Performance of a Single Cylinder, Four-Stroke Engine
 The aim of the use of fuel injection system is to improve the engine performance and fuel efficiency. An experimental study is conducted to compare the engine power and exhaust emission of a single cylinder engine run with injection timings and different fuel types (Pertalite and Pertamina Turbo).
- 18. Atma Jaya Catholic University of Indonesia** **Septhio T.P., Eka T. P., M. Sinaga, Fillian A. Nov. 17**
Test Bench for Measuring Volumetric Efficiency of Direct Injection Motorcycle Engine
 In recent years, motorcycle engine technology has undergone rapid development to provide a more efficient and eco-friendly engine which incorporate advanced energy saving technology. In particular, the change in the fuel distribution system technology from carburetor technology to fuel injection system. In order to study the performance of the fuel injection system in motorcycle engine, the test bench is specifically designed to measure the volumetric efficiency and energy power loss. These parameters are important in order to minimize losses due to the effect of pumping.
- 19. Atma Jaya Catholic University of Indonesia** **Hendy M., Louis B., Cristiand, D. Setyanto Nov. 17**
A New Design of Motorcycle Sprocket by Hole Arrangement
 Motorcycle for racing needs component that can withstand significant torsion and stresses. A new sprocket design based on the modified hole arrangement that is being investigated in this study. It is hope that this new sprocket can endure higher torsion and stress during the racing, and have a longer life-time for daily use.
- 20. Atma Jaya Catholic University of Indonesia** **Jovan J., S. Tobing Nov. 17**
Analysis of Spot Welding's Defect by Portable Spot Welding
 Portable Spot Welding (PSW) is commonly use in the manufacturing of automotive components because it is practical, short, and easy way to use. However, the PSW has some weaknesses which often results in the defects. In addition to impacting the final workpiece results, operator safety may be threatened. Therefore, defects in spot welding are a serious case and must be addressed further so that the frequency of occurrence of defects can be minimal.
- 21. Atma Jaya Catholic University of Indonesia** **Dennis F., A. Andrew, P.D. Basoeki Nov. 17**
Performance of Lithium and Lead Acid Battery for the Use in Solar-Powered Pedestrian Light
 The use of solar-powered street and pedestrian lights has become common around the world. This solar light is usually equipped with either Lithium or Lead Acid battery. This study is conducted to better understand the working process of both types of batteries, and to determine which type of battery is best-suited to be applied on pedestrian lighting system.
- 22. Atma Jaya Catholic University of Indonesia** **Hans R., J. Dionisius, R. Kurniawan, M. Januar Nov. 17**
Analytical and Numerical Methods for Predicting the Safety of Suspension Design on Student Formula Car
 The purpose of this study is to design a suspension system for a student formular car that meet the demand of safety and stability. Two different methods, analytical and simulation, are used in order to evaluate the proposed suspension design and predict its behaviour.
- 23. Atma Jaya Catholic University of Indonesia** **Inryono K., H. Sutanto, Purnomo S. Nov. 17**
Design of Urban Car Chassis and Suspension System with Numerical Approach and Graphical Simulation
 This study investigates design of an urban green car chassis including its material selection and analysis of stress and deformation. It is carried out by using numerical approaches and graphical simulations.