Session Description

Advanced Combustion

This session focuses on advanced combustion technologies in small powertrains and energy systems. The scope of topics includes studies of spark-ignition engine, compression-ignition engine, HCCI, low-temperature combustion, auto-ignited combustion, mixture formation, dilution effects, ignition, flame propagation, abnormal combustion, engine thermal efficiency and emissions formation.

Renewable Energy and Alternative Fuels

This session includes papers focused on the gaseous and particulate emissions performance by operating small engines, fuel as diesel ,gasoline on oxygenated fuel blends and renewable energy. The renewable energy includes hydrogen, ammonia, e-fuel , biomass fuel . e-fuel includes methane which is made of hydrogen and CO2 by methanation technology.

Collegiate Event

Papers in this session discuss innovations regarding entries in the SAE Collegiate Design Series (CDS) events.

Diesel Engine

Papers in this session will pertain to studies of diesel engines and their elemental technologies including their design, emission analysis and control, NVH, fuel system, fuel type, aftertreatment, combustion quality, or engine control.

Emission and Environmental Impacts

This session focuses on the studies about exhaust emission reduction systems and environmental impacts of pollutant materials such as VOC, NOx and particular materials on small ICE. Studies of exhaust gas aftertreatment systems including catalytic converter and gas filters, evaporative gas evaluation, combustion quality improvement, fuel composition analysis and so on that contribute to meet advanced emission requirement of the world, are included in this session. Besides these topics, studies on life-cycle-analysis and CO2 calculation are covered by this session.

Engine Components and Fuel Supply Systems

This session focuses on hardware and energy systems for the small powertrains.
The Hardware themes include support systems, injectors, EGR valves, manifolds, turbochargers, water pumps, ignition systems and more.
The energy systems themes include fuel pumps, injectors, and other components related to the supply of fuel from tank to the small powertrains, as well as systems and component issues related to combustion process optimization.

Powertrain Controls

Papers in this session are related to design, development and testing of new or innovative electronic controls or control systems for energy management system. Topics may include hardware, software and algorithm/function innovations as well as the associated sensors or actuators employed in the control system. Applications may range for not only SI engines but also power train system.

Engine Technology

Advanced engine technologies, design, and development for thermal efficiency, performance, and emissions, including cycle simulation. Topics may include geared transmission, CVT and clutch for improvement of energy efficiency and performance of the whole vehicle.

Hybrid and Electric Drives

This session will discuss hybrid and EV applications

Lubricants and Tribology

Lubricants, Lubricant Performance, Lubricant additives, Tribology, Friction, and Wear

Materials and Manufacturing

This session focuses on materials and manufacturing technologies for small powertrains and energy systems and body applications. Possible topics of materials technologies include metals and alloys, polymers, composites and fine ceramics. Topics of manufacturing technologies include casting, forging, press working, heat treatments and surface treatments. Also, several phenomena of engine and body components such as fatigue, wear, fracture and corrosion can be dealt in this session.

NVH Technology

All aspects of small powertrains and energy systems related noise and vibration are covered in this session including generation, experimental techniques, measurement, numerical analysis, NVH materials, source identification, NVH quality and novel solutions.

Two Stroke Engine

This session contains manuscripts focused on two-stroke engines. Topics such as emissions, performance, and efficiency will be explored. Advanced combustion control, direct fuel injection, simulation models and experimental results will be presented.

Vehicle Dynamics and Safety

This session is focused on vehicle dynamics and chassis technologies including stability and maneuverability, handling, ride and comfort of a vehicle such as Motorcycles and ATV's.

Functional safety, defined by ISO26262, of electrical and/or electronic systems that are installed in motorcycles will be also discussed.

Vehicle Components

This session focuses on hardware not associated with the engine and drivetrain that supports the purpose of the vehicle such as suspensions, lighting, dampers, marine hulls, steering, vehicle frame, and heating and cooling systems.

Small and Micro Combined Heat and Power (CHP) Systems

The session includes research papers focused on CHP applications and technologies up to an electrical output of 50 kW (combustion technologies like spark ignition and diesel engines, Stirling power units, micro turbines, ORC, fuel cells, etc.) fueled by natural gas, light oil gas, biogas, rape oil, RME and other alternative fuels.

Data Driven Digitalization

This special session aims to bring together experts from industry and academia to jointly discuss possible applications of digitalization. Specifically, in addition to classical research articles, we welcome application papers, showcasing the successful application of digitalization in small engines technologies, as well as concept papers, which speculate about such future successful applications.

New product technology

The aim of this session is to share technology information regarding new products, services, manufacturing devices, development tools including software and other new items in the fields covered by SETC. The superiority and novelty of functions, performance advantages and value proposition related to the products, services and so on, can be shown in this session by discussing from a technical point of view.