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SPACE PROPULSION SYMPOSIUM (C4)
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CASC, China, leifanpeicasc@163.comADVANCEMENT AND FUTURE APPLICATION OF SPACE PROPULSION TECHNOLOGY USING
HYDROCARBON PROPELLANTS IN CHINA**Abstract**

Hydrocarbon fuels are not only the main fuels used in aero engine and ramjet engine but also the future popular fuels used in space rocket engines as high performance, low cost, non-pollution and safe rocket propellants for state-of-art launch vehicles, which make it become the main development object of liquid rocket propulsion technology for future launch vehicle in many countries. High performance hydrocarbon propellants, typically kerosene and methane, are also researched as main propellant candidates in different combined engines such as TBCC, RBCC and ATR etc. To clarify the direction for subsequent development and future applications of space propulsion technology using hydrocarbon propellants in China, physical and chemical properties, as well as application features of typical hydrocarbon fuels including kerosene, methane, and propane were analyzed comparatively. The recent state-of-art and advancements of space engines with hydrocarbon propellant were briefly presented in the area of expendable launch vehicles, reusable launch vehicles, high-performance upper stage propulsion, non-toxic in-space propulsion and air-breathing propulsion system. Space engines with hydrocarbon propellants, LOX/Kerosene rocket engine and LOX/Methane rocket engine as the representative will lead the future development trend of high-performance and low-cost space propulsion systems. LOX/Kerosene rocket propulsion has an outstanding heritage demonstrated in first place by the large variety of Russian engines developed and successfully operated until today. LOX/Methane propulsion, on the contrary, has never been developed up to engines in launch service, but is recognized for its properties and features that are superior to kerosene in certain ways. According to Chinese research progress and technology, the new power system with LOX/Hydrocarbon rocket engines as the core, has a good prospect in the adaptability of future China's space activities including earth to orbit, manned lunar and deep-space exploration, etc.