

SPACE PROPULSION SYMPOSIUM (C4)  
Hypersonic Air-breathing and Combined Cycle Propulsion (9)

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TRRE TECHNOLOGY DEVELOPMENT

**Abstract**

TRRE is a high-speed air-breathing propulsion system proposed by Beijing Power Machinery Research Institute. This novel combined cycle engine can enable reusable launcher systems and hypersonic airplane. Progress in the last twelve months has been rapid in both programmatic and technology development. The company's primary objective is to deliver the first free jet test of TRRE principle prototype by the end of 2017 and deliver the free jet of TRRE engineering prototype by the end of 2020. To meet this aim, technology development has focused on the design and development of wide-range adjustable intake and nozzle, structure integrated and working conditions variable rocket, wide adaptive rocket-ramjet combustor, etc. In parallel, extensive research and ground test continues for critical aspect of the principle prototype engine installation, specifically the intake, rocket, nozzle and rocket-ramjet combustor. The full propulsive system will ultimately be demonstrated in a free jet test by the end of 2017. This paper presents key aspects of the technology development program taking place at Beijing Power Machinery Research Institute and provides an overview of the TRRE development program and demonstration engines.