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Author: Dr. Li Wan  
United States, saaopl@yahoo.com

SAAOPL SYSTEM: ITS DESIGN AND TECHNICAL FEASIBILITY STUDY

**Abstract**

SAAOPL is a novel launch system aiming to offer human a new generation two-way transportation solution to earth orbit. It is distinct from existing and in-development launch systems in its fundamental design principals, system components, flight profile and also trajectory. SAAOPL system introduces a hybrid structure as its stratospheric launch platform, and then combines stratospheric launch with horizontal takeoff and horizontal landing (HTHL) reusable launch vehicle, to avoid the complexity and performance penalty brought by flying super/hypersonic winged vehicle through dense atmosphere. This paper will provide an introduction to SAAOPL system and explore its potential features, such as full reusability, reliability, and short launch cycle.

Albeit SAAOPL is a new launch system design for the next generation, it isn't beyond the present level of technology. Prerequisites to its successful development don't include fundamental technology breakthroughs in related fields. For instance, its propulsion system is still using a modified version of conventional rocket engine and doesn't involve new conceptual engines at least in its initial development, such as aerospike engine, scramjet or hybrid air-breathing rocket engine. As such, besides the introduction of SAAOPL's design and features, this paper will also conduct a technical feasibility study of SAAOPL system upon existing aerospace systems and technology.