

SPACE SYSTEMS SYMPOSIUM (D1)
Innovative and Visionary Space Systems Concepts (1)

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SOCIETAL SPACE SYSTEMS: A FUTURE TO FRACTIONATED SPACE SYSTEMS

Abstract

Fractionated space systems have been proposed as a higher-value alternative to monolithic space systems under uncertain environments. In fractionated space systems a satellite is split into free-flying stand-alone fractions, yet forming a closed and individual entity, that provide levels of flexibility and adaptability that make a space system capable of overcoming a number of uncertain scenarios during its development and during its operational life. Researches have explored business cases and prepared feasibility analyses for this type of missions. In particular, significant effort is being spent to assess under which circumstances a customer would decide for a fractionated space system under the current socio-technical-economical context. However, with a first mission scheduled to fly by the end of the year the time comes to think about what comes next. Using evolution of human society as a paradigm (structural elements, person, tribe, and society) this paper proposes the concept of Societal Space Systems as the natural evolution to fractionated space systems: fractions create infrastructure that serve the purpose to support independent payloads or missions. For example, a payload could be launched into space and make use of the available infrastructures (energy, communication, positioning, processing services, and alike) on a fee, just like people make use of energy, communication, navigation, etc. The present paper is based on a scenario in which fractionated space systems have been consolidated and their possibilities expand beyond decomposing a satellite in multiple pieces.