

SPACE SYSTEMS SYMPOSIUM (D1)
Space Systems Architectures (4)

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THE ISIS AIS CONSTELLATION

Abstract

This paper provides an overview of the current status of the ISIS Satellite-AIS Constellation of 16 – 20 spacecraft. Of this constellation, two demo satellites are currently undergoing AIT at ISIS. These missions will pave the way for a commercial nanosatellite constellation of satellites that use CubeSat technology for an operational, commercial space based AIS system. This constellation aims to serve user applications in the maritime domain and utilizes the advantages of small and nanosatellites to create affordable constellations that provide high temporal resolution products to users. These pioneering missions have been developed to be small, rapid and cost-effective and provide a staged approach to demonstrating its patented space based AIS technology. With the recent increased interest in cost-effective nanosatellite missions a shift in applications is noticed within this young niche within the space sector.

About a decade ago, CubeSat and other tiny satellites arrived back on the scene as a low cost means for universities and research groups to be involved in real space missions again, with spacecraft that would actually fly within a few years after the project kick-off. This fuelled a surge in education and outreach missions, for which these satellites form a great, affordable tool, which as an added benefit could also be used for in-orbit demonstration missions for new technologies. However, it also fuelled the debate on the actual utility and usefulness of these new satellites; what can you use a nano-satellite for? Recent developments start to show real and valuable utility in terms of telecommunications, messaging and monitoring applications of which the ISIS satellite-AIS application is one example of using nanosatellite for commercial and operational applications.

The paper will highlight a variety of aspects of the AIS constellation. An overview of the constellation, its objectives and expected performance will be given. The big challenges that are faced when deploying such a system are constellation and data management, which drive the mission architecture and force choices in areas such as the autonomy levels of both the ground and space segment architecture. The trade-offs and rationale behind these decisions will be given.