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MICROSATELLITE CONCEPT FOR MARITIME APPLICATIONS

Abstract

Earth water bodies have a major impact on our daily lives; they play a fundamental role in global economics, defence, security and environment. As a result ship tracking has become decisive to activities as diverse as securing countries' borders and national trade, protecting natural resources or managing global stocks. Albeit a number of maritime applications require exhaustive sets of data with information on ships' velocity, course or nationality, the main concern for most applications is to obtain regular, un-jammed and un-spoofed vessels' position with frequent updates and short data latency. Traditionally the fulfilment of those requirements has entailed complex and expensive activities partly due to the vast expanse of the areas of interest and partly because of political and sovereignty clashes. More recently remote sensing SAR and AIS satellites have successfully overcome some of the aforementioned limitations but, as of today, none deployed system provides widely available and fully operational service as current assets offer limited performances, limited coverage or high deployment costs.

This paper presents a cost-effective alternative concept for maritime applications with a constellation of microsatellites delivering data to a wide range of maritime services either in a standalone configuration or in cooperation with existing assets. The recent technological developments at SSTL have boosted platform capabilities enabling light microsatellites to achieve performance envelopes of much larger satellites of the past. The combination of a new generation payloads coupled with the recent avionics developments results in a highly capable system delivering high quality dedicated services. The paper highlights the specific advantages of ship surveillance with alternative payload technologies through in-orbit samples and addresses its particular limitations and constrains. Finally a system architecture optimised to shorten latency and revisit times is presented.