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A CONSTELLATION OF NEAR-EQUATORIAL BASED INTERFEROMETRIC SAR SATELLITES: A CLOSER LOOK AT THE BENEFITS TO DEVELOPING NATIONS

Abstract

The Equatorial region plays host to over 45 developing nations, with only 6 of these nations currently investing in the use of space, as a possibility for human and urban development. This paper discusses the potential benefits that can be achieved by deploying a constellation of near-equatorial low Earth orbiting semi-active SAR spacecraft. It starts with a cross examination of the various ways each of the 6 developing nations, with varying levels of space capabilities, have contributed to supporting development and assisting with disaster monitoring and mitigation on both national and international levels. It discusses these space outfits and their contributions during past and present occurrences of natural disaster and peacetime applications. The paper also suggests various means of enlightening developing nations on the benefits of space from both an educational and commercial perspective. Furthermore, the work highlights several areas, such as agricultural mapping, crop monitoring, national security and disaster mitigation that would be greatly enhanced by access to real-time data from the proposed constellation of Interferometric SAR (InSAR) satellites. The data throughput of the constellation will be discussed as well as the proposed mission configuration. The work also considers the system parameters, mission objectives, baseline configuration and formation stability. To this end, it details the level of flexibility achievable by the proposed constellation and illustrates a few potential application scenarios such as traffic monitoring and digital elevation model generation (DEM).