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IMPLICATIONS OF MEGA CONSTELLATIONS OF SMALL SATELLITES ON EARTH
OBSERVATION REGULATIONS AND POLICIES

Abstract

Several small satellites operated in a same orbit, forming a constellation, have achieved dramatic improvements in temporal resolution whilst advances in microelectronics have enabled higher spatial resolution with adequate spectral fidelity for many applications. While constellations of satellites have been operated commonly thus far, number of satellite in one constellation had been relatively limited until recently. Today, mega constellation, which makes possible operation of tens and hundreds of small satellites in the same orbit, has been proposed and operated by startup companies. There are several small satellite companies such as Planet and Satellogic that are proposing or operating mega constellation of more than 100 satellites providing high revisit capabilities one or several times per day. Such mega constellations are likely to realize eventually near real time monitoring the entire Earth offering affordable access to global map updated on an hourly basis. These emerging next generation constellations would bring a revolution to EO applications from both technical and operational standpoint, however, the regulations and policies associated with satellite remote sensing that have been developed over the last three decades are likely to become very rapidly out-of-date and ineffective when faced with the circumstances surrounding operations of mega constellations. This paper outlines key features set forth in regulations and policies associated with satellite remote sensing in the US, Canada, Germany, France and Japan and discusses how mega constellations have critical implications on current satellite remote sensing regulations and policies.