



Micro/nano-satellite as a Platform for Space Remote-sensing

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For a long period, the main players in precise imaging with satellite has been limited to big space agencies or big powers. But now micro or nano satellites lighter than about 50 kg started working as an operational tool, which can be developed and operated by individual laboratory in university, company or developing country.

One of the bottleneck of the space remote-sensing with conventional big satellite is the long re-visiting period. For example, LANDSAT captures a certain place only once 16 days, which is apparently too long for disaster management or monitoring of farmland. Thanks to the flexible on-demand operation by target pointing, one micro-satellite could visit any point in the Earth within one or two days. If we establish the constellation consisting of few tens of micro-satellite, we can realize the continuous monitoring. Another problem in space remote-sensing is the low reliability of obtained results. The amount of crops estimated by satellite multicolor images sometimes shows a large error, and the classification of vegetation doesn't match the ground truth. However, our advanced spectral cameras with liquid crystal technology already evidenced very high performance in precise spectral measurement applied to the detection of disease in plantation. The 50-kg satellite has enough resources in space and electrical power to hold several cameras simultaneously, which enables us to make comprehensive remote-sensing. For example, RISING-2 satellite launched in 2014 carries one spectral imager with selectable 400 bands and 5 m GSD, one two-bands middle-field camera, one thermal infrared camera and one fish-eye camera.