

Development of the compact infrared camera (CIRC) with uncooled infrared detector

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The compact infrared camera (CIRC) is one of the technology demonstration payloads of Small Demonstration-Satellite (SDS). The CIRC is an infrared camera equipped with an uncooled infrared array detector. Uncooled infrared array detectors have an advantage of no requirement of cooling mechanisms such as a mechanical cooler. The eliminating of detector cooling system can reduce the size, cost and electrical power of the sensor. The CIRC is developed for the future disaster monitoring with a thermal infrared imagery.

The main mission of the CIRC is the technology demonstration of the wildfire detection using the uncooled infrared array detector. Wildfires are one of the major and chronic disasters affecting many countries in Asia-Pacific region, and some suggestions are that this will get worse with global warming and climate change. In Sentinel Asia project to share the disaster information in near real-time across the Asia-Pacific region, the wildfire detection is chosen as one of the important activities.

We set the basic specification to meet requirements for the wildfire detection. The detector is a large format (640 x 480) to obtain wide field of view. The spatial resolution is an important factor for the wildfire detection. The baseline specification of the spatial resolution is 200m from SDS orbit.

We show the details of the design and concept of the CIRC. We also show the feasibility study of the wildfire detection using Terra/ASTER data.