HJ-1 Small Satellites and Application for Disaster Reduction

National Disaster Reduction Center of China

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Content

1. Disaster Information in China in 2009
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China is one of the countries which suffers the most natural disasters in the world. In 2009, because of the natural disasters, there were

- 480 million people affected;
- 1528 people dead or missing;
- 7.1 million people evacuated and resettled;
- 47.2 million ha crops affected;
- 838 thousand houses collapsed.

The direct economic loss is 252.3 billion RMB.
Figure of main natural disaster damage indexes
Drought Disaster Distribution Map in 2009
Small Satellite Constellation for Environment and Disaster Monitoring
On Sep., 6th 2008, China launched two optical satellites named HJ-1-A and HJ-1-B separately.

A SAR small satellite named HJ-1-C will be launched in coming years.

The final object is to realize the plan of a constellation consisting of four optical satellites and four SAR satellites.
# Satellites Parameters

<table>
<thead>
<tr>
<th>Satellite</th>
<th>Payload</th>
<th>Spatial Resolution (m)</th>
<th>Swath (km)</th>
<th>Band Number</th>
<th>Revisit time (hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HJ-1-A</td>
<td>CCD</td>
<td>30</td>
<td>700</td>
<td>4</td>
<td>96</td>
</tr>
<tr>
<td>HSI</td>
<td>100</td>
<td>50</td>
<td>115</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>HJ-1-B</td>
<td>CCD</td>
<td>30</td>
<td>700</td>
<td>4</td>
<td>96</td>
</tr>
<tr>
<td>IRS</td>
<td>B1、B2、B3：150</td>
<td>720</td>
<td>B4：300</td>
<td>4</td>
<td>96</td>
</tr>
</tbody>
</table>
National Disaster Reduction Center of China (NDRCC) is in charge of the operation management of the HJ-1-A/B satellites. Till now, the satellites and payloads are in well operation conditions. There are totally more than 3,400 orbit of images have been acquired and the tasking time of the two satellites is more than 400 hours since being launched. Totally more than 170,000 scenes images were acquired.
Space Technology Application for Disaster Reduction
Operational Working Modes

- **Routine operational working mode**
- **Emergency operational working mode**
China Mosaic Maps for Different Seasons

- Winter in 2008
- Spring in 2009
- Summer in 2009
- Autumn in 2009
Background Parameters Extraction

**Landuse/cover**

**Vegetation characteristic parameters**

**Aerosol optical thickness**

**Surface temperature, emissivity**
Disaster Risk Assessment
Disaster Monitoring Products
Disaster Damage Assessment

利用2009年8月中旬、6月下旬及2008年9月上旬至2008年9月下旬MODIS植被指数产品对北方部分地区旱灾进行监测。结果显示：重灾区主要位于黑龙江西部、吉林西部、内蒙古东部和中部以及辽宁西部、河北北部、山西北部、宁夏中北部、甘肃中东部、新疆西部。
International Product Service
From Feb. 9 to the mid of March in 2009, NDRCC provided more than 126 scenes of HJ satellite images and 24 products to Australia government to support their emergency relief. Australia government expressed great appreciation for the support effect.
Haiti Earthquake monitoring using HJ-1 of China
谢谢
Thanks