

## The software structure and data flow of ecological remote sensing system

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The inspection of earth surface from outer space with remote sensing spacecrafts is one of the most important anthropic activities in the 20th century. The daily imagery quantity of observation is more and more, while the time requirement of the data process is shorter and shorter in actual application. Remote sensing is a widely used tool to supervise the ecological chain. HJ-1 constellation was designed for environment protection and disaster precaution, which includes HJ-1A, HJ-1B and HJ-1C, by the China Space Bureau. HJ-1A and HJ-1B that lunched in 2008 are optical and infrared with the designed parameters show as Table 1. HJ-1C is radar and was adjourn to 2012 for technical obstacle.

Table1. HJ-1 constellation designed parameters

Satellite	Sensor	Bands( $\mu\text{m}$ )	Spatial resolution(m)
HJ-1A/B	CCD	0.45~0.52,0.52~0.59,0.63~0.69,0.76~0.90	30
HJ-1A	HSI	0.45~0.95 totally 115 bands	100
HJ-1B	IRS	0.75~1.10,1.55~1.75,3.50~3.90,10.5~12.5	150(300TIR)

HJ-1 ecological remote sensing system(HJES) is designed and developed aimed at the HJ-1 imagery for ecological thematic and professional products. The applied structure of HJES is Client/Server mode that satisfies the need of multi-personnel cooperation. The systemic structure of HJES are divide into six layers by the user applied layer at the topmost, and then middle applied layer, processing layer, data support layer, environment support layer, with the hardware support layer at the bottom shown as the left part of Fig.1. The user applied layer faces to the final operationer with computer screen, printer, and projector, and the middle applied layer managers the image processing, systemic configuration and operation help. Product retrievals such as LAI, NDVI, GPP and LST are hold in the processing layer. Auxiliary, metadata, imagery and log data are supported by the data support layer at the underpin of environment support layer, which composed of ArcGIS, Windows, Oracle, IDL and et al. The hardware support layer is consist of computer, net-ware and store-ware.

The exterior data flow of HJES involves operational manage system(OMS) and database manage system(DMS). HJES receives order mission form the OMS and extract processing data from DMS. The interior data flow of HJES entails client-subsystem(CSS) and server-subsystem(SSS). The CSS side main works are the product index specification, order affirmance and order submission. The SSS side executives from order complement, data decompression and validation, crossing-area extraction, product production, map render, report creation, metadata fulfillment to result archive show as the right of Fig. 1. Three level processing parallels, signed as task parallel, subdata parallel and algorithm parallel are taken into account for the processing acceleration in the product production subflow.

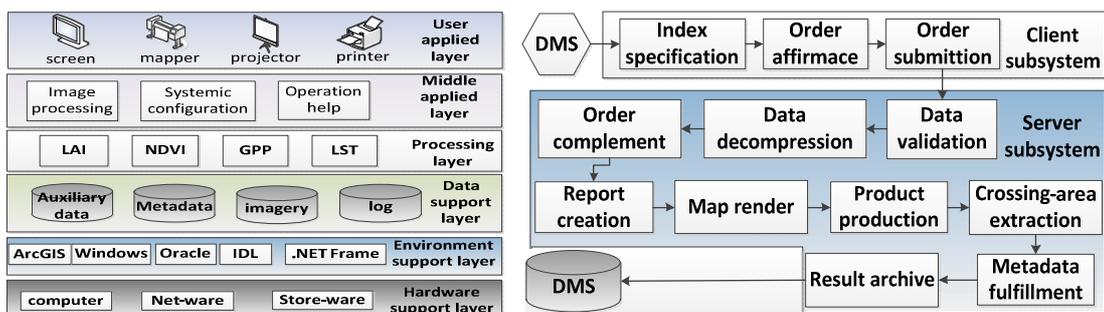


Fig.1 The systemic structure and data flow of HJES