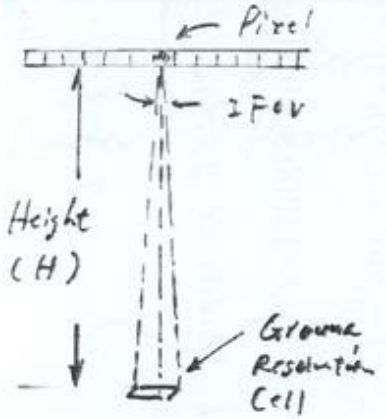
Spatial Resolution & IFOV



(Instant Field of View)

Ground Resolution Cell

= Spatial Resolution

$\simeq H \cdot [IFOV]$ - Optical Sensor,

$\simeq H \cdot \left[\frac{\text{Pixel Size of Sensor}}{\text{Focal Length}}\right]$

$\simeq H \cdot \left[\frac{\text{Spatial Resolution}}{H}\right]$

Pixel Size and Scale

$$\text{Scale} = \frac{\text{Distance on Map Sheet}}{\text{Distance on Ground}}$$

$\simeq$ ~~Distance~~ 1 / Scale Number

$$= \frac{\text{Pixel Size on Image Map}}{\text{Ground Resolution Cell}}$$

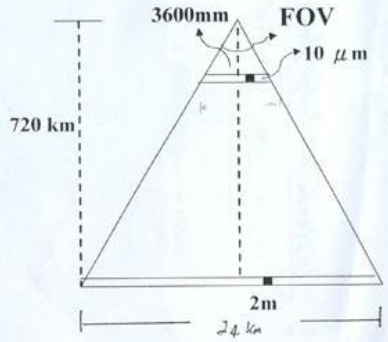
$$\simeq \frac{1}{5{,}000 \times \text{Ground Resolution Cell (m)}}$$

(Empirical) max. 2.3.1

$$\simeq \frac{\text{Max Pixel Size (200 } \mu\text{m)}}{\text{Ground Resolution (m)}}$$

福衛五号 RSI (CMOS)

相關參數關係式



$$IFOV \cong \frac{\text{地面解析度}}{\text{衛星高度}} \cong \frac{PixelSize}{FocalLength}$$

$$IFOV \cong \frac{2m}{720km} = \frac{10\mu m}{3600mm}$$

$$= \frac{1}{360000} rad = 2.778 * 10^{-6} rad$$

$$2.778 * 10^{-6} rad * 12000 = 1.91 \deg = FOV$$

Swath Width $= 2H \cdot \tan\left(\frac{FOV}{2}\right)$

2.3.32

Scale	Image Resolution	Coverage
Larger	Better	Smaller
Smaller	Poorer	Larger

Object Space (物空间) → Resolution Cell

IFOV → Resolution Cell (Platform Height)

IFOV → Pixel Size of the Sensor

Sensor Image Space → Focal Length

(像空间)

成(测定

Object Space (物空间) → Resolution Cell

Scale

Image Space (像空间) → Pixel Size on Image Map

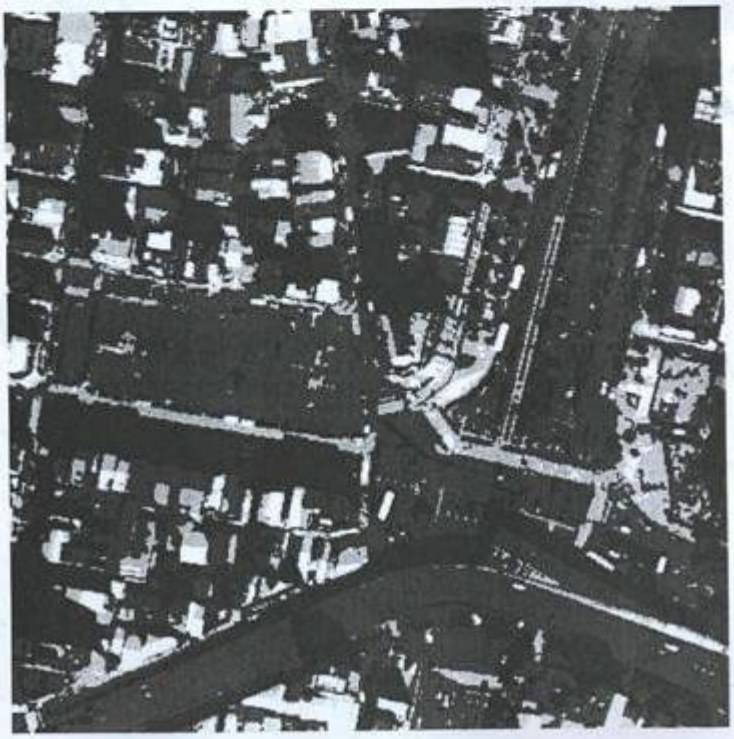
2.3.23

台北市

QuickBird

0.6m

地面解析力影像



2.53