



KOMPSAT-5

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## Kompsat-5 Sigma Naught Equation

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# K5 RCS Equation



- K5 RCS Equation

$$RCS[dBsm] = 10 \log_{10} \left[ CALCO \sum_{\{i,j\} \in D}^N |(I_{i,j} \cdot RF)^2 + (Q_{i,j} \cdot RF)^2| \right]$$

- CALCO is calibration constant, RF is rescaling factor,  $I_{i,j}$  and  $Q_{i,j}$  are real and imaginary pixel values at  $i^{\text{th}}$  row and  $j^{\text{th}}$  column, respectively.
- CALCO & RF can be found in attributes of K5 image file with the name of “Calibration Constant” and “Rescaling Factor”, respectively.



# K5 RCS & $\sigma^0$ Equation



## • K5 $\sigma^0$ Equation

$$\sigma^0 [dB] = 10 \log_{10} \left[ \frac{CALCO}{N(\delta_a \delta_s)} \sum_{\{i,j\} \in D}^N |(I_{i,j} \cdot RF)^2 + (Q_{i,j} \cdot RF)^2| \sin(\theta_{i,j}) \right]$$

- $N$  is number of pixels,  $\delta_a \delta_s$  are azimuth and slant range resolutions,  $\theta$  is local incidence angle.
- $\delta_s = \frac{c}{2 \cdot BW_{rg}}$ ,  $c$  is speed of light and  $BW_{rg}$  is “Range Focusing Bandwidth”. They can be found in attributes of K5 image file.
- $\delta_a$  can be found in attributes of K5 image file with the name of “Azimuth Instrument Geometric Resolution”.
- $\theta$  can be calculated using GIM layer data as follows:

$$\theta [deg] = GIM * GIM_{RF} - GIM_{Off}$$

- $GIM_{RF}$  is “Rescaling Factor” and  $GIM_{Off}$  is “Offset” in GIM layer attributes of K5 image file