

## IMAGE QUALITY PARAMETERS - A CRITICAL RERVIEW

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### ABSTRACT:

Digital cameras for airborne and spaceborne remote sensing are today well established in the market and have replaced the analogue mapping cameras. A general improvement in image quality accompanied the digital camera development. The signal-to-noise ratio and the dynamic range are significantly better than with the analogue cameras. In addition, digital cameras can be spectrally and radiometrically calibrated.

To ensure comparability of the sensors and image products, descriptive variables or metrics for image quality are necessary. The determination of the quality of remote sensing data can in principle distinguish (spectral) radiometric and (spatial) geometric aspects. For the description, different metrics can be found relating to radiometric and geometric accuracy aspects (conversion of radiances into digital numbers (DN), geometric point accuracy, eg CE90) but also performance parameters (SNR, MTF).

Here we concentrate on the performance analysis, which is related to the following parameters:

- Signal-dependent SNR
- MTF in different directions and at different places within the image
- Other (e.g. overshoot term after image processing)

A balance of the modulation transfer function (MTF), and signal-to-noise ratio (SNR) is achieved by the system architecture to optimize the cost, complexity and risk with regard to requirements of end users.

Thus the quality of satellite images is often described by NIIRS (National Imagery Interpretability Rating Scale) in the user community. However NIIRS it is not the ultimate parameter to describe quality of images, because NIIRS has been proposed as a measure of image quality in terms of interpretability. Other sensor parameters, e.g. spectral resolution and number of spectral channels, are not involved in this calculation.

Many other image quality metrics have been proposed in the very recent years. This paper will give a critical overview of standards and alternative approaches in image quality criterias, and the derivation and use of these parameters.

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