

**ANALYSIS OF SPOT-6 DATA FUSION**  
**USING GRAM-SCHMIDT SPECTRAL SHARPENING**  
**ON AGRICULTURE LAND**

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**ABSTRACT**

Image fusion is a process to generate higher spatial resolution multispectral images by the fusion of lower resolution multispectral images and higher resolution panchromatic images. It is used to generate not only visually appealing images but also provide detailed images to support applications in remote sensing field, including agriculture. The aim of this study is to evaluate the performance of SPOT-6 data fusion using Gram-Schmidt Spectral Sharpening (GS) method on agriculture land. Comparing GS method with Principle Component Spectral Sharpening (PC) method was done to evaluate the reliability of GS method. In this study, the performance of GS is presented based on multispectral and panchromatic of SPOT-6 image. The spatial resolution of the multispectral (MS) image is enhanced by merging the high resolution Panchromatic (Pan) image in GS method. The fused image of GS and PC were assessed visually and stastically. Relative Mean Difference (RMD), Relative Variation Difference (RVD), and Peak Signal to Noise Ratio (PSNR) Index were used to assess the fused image statistically. The test sites of agriculture land devided into four main areas i.e. whole area, rice field area, forest area and settlement. Based on the results, the visual quality of the fused image using GS method is better than using PC method. The color of the fused image using GS is more better and natural than using PC. In the statistical assessment, the RMD results of both methods are similar. In the RVD results, GS method is better then PC method especially in band 1 and band 3. GS method is better than PC method in PSNR result for each test site. It is observed that the Gram-Schmidt

method provides the best performance for each band and test site. Thus, GS method is robust method for SPOT-6 data fusion especially on agriculture land.

Keyword : Data fusion, SPOT-6, Gram-Schmidt, PSNR, agriculture