

SCHOOL OF ENGINEERING

FINAL REPORT

INVESTIGATION ON THE IMAGE FIDELITY OF
JPEG2000 IN ASTRONOMICAL IMAGES

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Abstract

This paper presents a study of "Investigation on the image quality fidelity of JPEG2000 in Astronomical Images". It shows images in TIFF format being tested in JPEG2000 the new standard compression standard in file size. The astronomical pictures are then tested that will yield the characteristics in terms of image quality and compression. The astronomical images are from solar system, nebulas, supernovas, asteroid, comet, galaxy, sun, and stars. The image quality is determined using the peak signal to noise ratio (PSNR) with respect to the compression rate. With JPEG2000, images are to be compressed in either lossy or lossless mode, and an option to select the desired file size function. The availability of these functions enables the image to be compress in either some loss of data which is lossy or no loss of data that is lossless. This investigation will depict the different type of images in a few categories to find the characteristics and the trade off point of image quality and compression. Highlighted in this submission will be the high and low frequency of images, the lossless compression characteristics, variation of dimensions in terms of image quality, testing with different JPEG2000 encoders and the compression to 8bpp which is ideally lossless.