# SAR IMAGE LOOK DIRECTION BIAS CORRECTION USING WAVELET TRANSFORM

Wooil M. Moon[1], J.S. Won[2], and X.G. Miao[1]

1. Geophysics, The University of Manitoba, Winnipeg, Canada R3T 2N2
(wmoon@cc.umanitoba.ca)

2. Marine Geophysics, Korea Ocean Research and Development Institute
P.O. Box 29, Ansan City, Ansan, Kyunggi-do, Korea
(jswon@sari.kordi.re.kr)

ABSTRACT

Look direction bias in a single look SAR image has been a problem in the geological application of SAR data, particularly in the relatively flat Precambrian shield terrain. This paper investigates digital processing techniques for airborne and space-borne SAR image data integration and for correction of look direction bias problem. The two important approaches for reducing the look direction bias problem are principal component analysis (PCA) and Wavelet transform (WT) techniques.

In this research we investigated and tested the techniques with ERS-1, JERS-1 and CCRS's airborne SAR data sets. The PCA technique has been proved to be very effective in various remote sensing applications. The PCA technique, however, requires three (or at least two and one auxiliary ) data sets for rendition of the properly corrected final image. The Wavelet transform approach utilizes the property which decomposes image data into approximated image (low frequency) and detailed image (high frequency). The Wavelet transform approach is more efficient and robust in enhancing the fine details of the multiple SAR image data without sacrificing the original image resolution.

KEY WORDS : SAR, Wavelet transform, Geological remote sensing, Look direction bias