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Effects of DSM and DEM on Orthorectification of High Resolution Satellite Imagery

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Abstract

Horizontal geometric error is one of the important issues for a comparison between a satellite image and point level observations in plotscale ecological studies. This is because a sub-meter or less than 10-meter horizontal error is required for such investigation. It is recognized that orthorectification with topographical information is an effective method to provide an image with fine horizontal accuracy. Most of commercial high resolution satellites publish an ortho-photo product and its nominal horizontal errors. Although tree height also affects the horizontal errors as well as topographical elevation, orthorectification accuracy in a forest area does not evaluate quantitatively due to difficulties of GCPs on a forest canopy plane. This paper describes the quantitative evaluation of horizontal accuracy of ortho-QuickBird images using the DEMs (digital elevation model), the DSM (digital surface model) and the control points on the top of the tree canopy.

Keywords: QuickBird, IKONOS, ALOS, horizontal error, tree height

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