
ETM+

Archive of SID

ETM+ :

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Archive of SID

ETM+

ETM+



-Sample Ground Truth

-Enhanced Thematic Mapperplus

- Geometric Correction

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-Toutin

- Geocoded

-Resampling

- Nearest Neighbour

- Image Enhancement

- Band Arithmetic

- Principal Component Analysis

-Tasseled Cap Transformation

-Fusion

-Geographic Information System

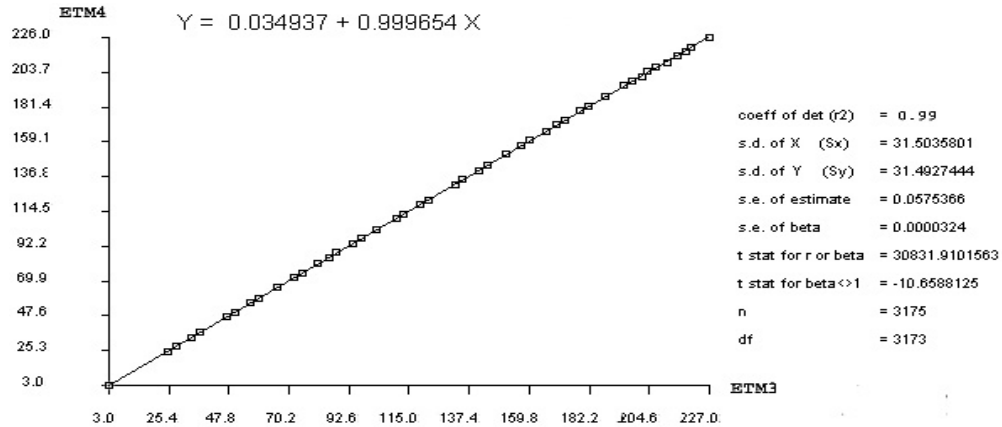
- Stiping and Banding

$r^2 = \dots$

$y = \dots x + \dots$

y = ETM

x = ETM



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TSAVI WdVI ()
MSAVI MSAVI T SAVI
()

- Maximum Likelihood
- Parallelepiped
- Spectral Angel Mapper
- Mode
- Error Matrix
- Producer Accuracy
- User Accuracy

- Training Area
- Divergence

ETM3 ETM1	Ratio1
ETM4 ETM3	DVI
$(ETM3 ETM1)/(ETM3 + ETM1)$	Ratio 2
$(ETM4 ETM1)/(ETM4 + ETM1)$	Ratio 3
$(ETM4 ETM3)/(ETM4 + ETM3)$	NDVI
$(ETM7 ETM4)/(ETM7 + ETM4)$	Ratio 4
	Brightness
	Greenness
	PCA1(1,2,3)
	PCA1 (4,5,7)
	PVI
	SAVI
	MSAVI2
	TSAVI 1
	TSAVI2
	WDVI
	Fusion SR (2,3,4)
	Fusion IHS (1,2,3,4,5,7)
	Origin

$$\left(\begin{array}{c} / \\ / \\ / \end{array} \right) \begin{array}{c} x \\ y \\ / \end{array}$$

- RMSE

-Bathacharia Distance

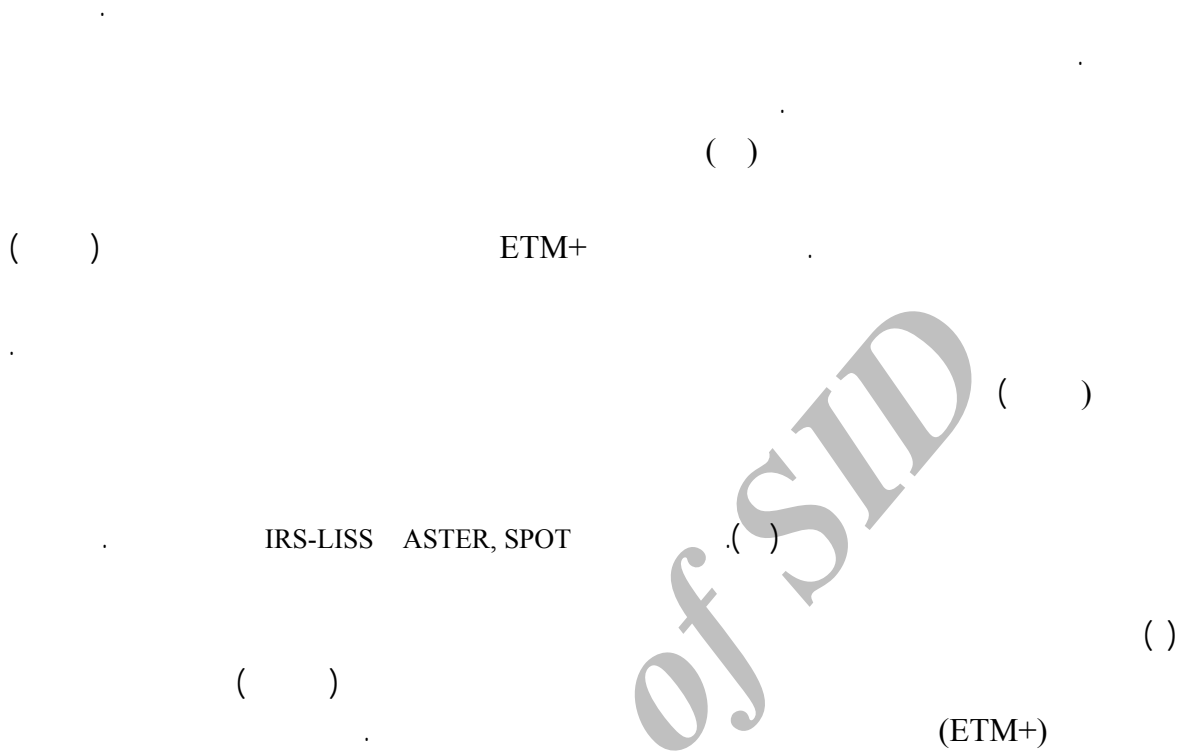
Ratio : / /
 / / ETM ETM ETM , Ratio , Ratio , IPVI, ETM , SAVI, ETM ,
 MSAVI , ETM , ETM
 : / / PCA (), WDVI, FusionSR , PVI

ETM , ETM , Ratio , TSAVI , Ratio , ETM ,
 ETM , ETM , ETM , PVI, ETM , IPVI,
 TSAVI , FusionSR
 (/)
 ()

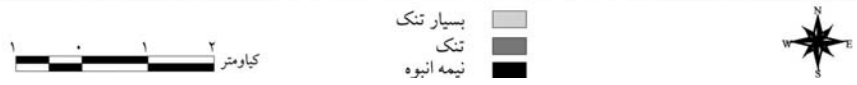
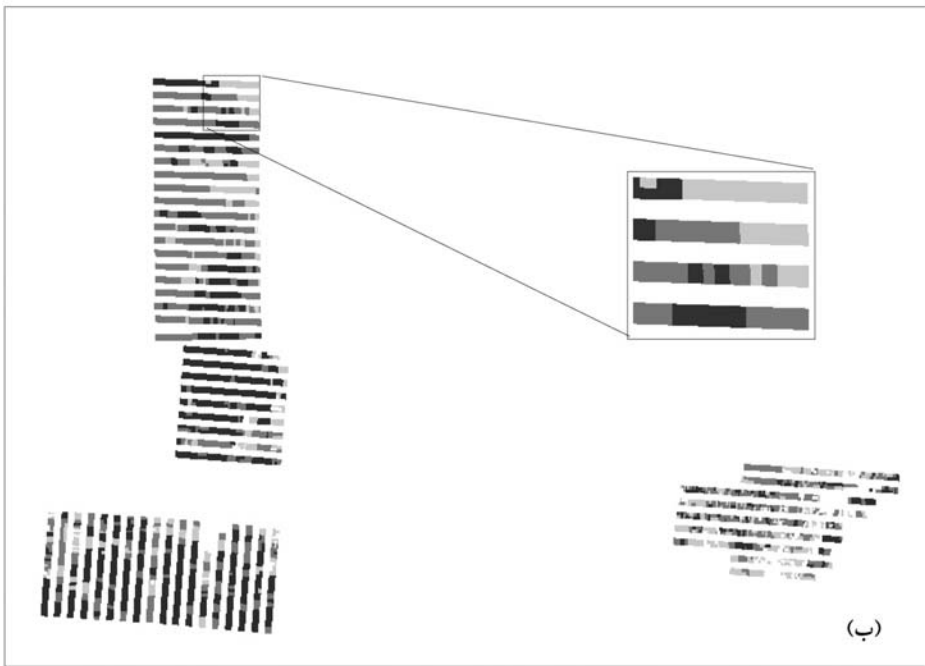
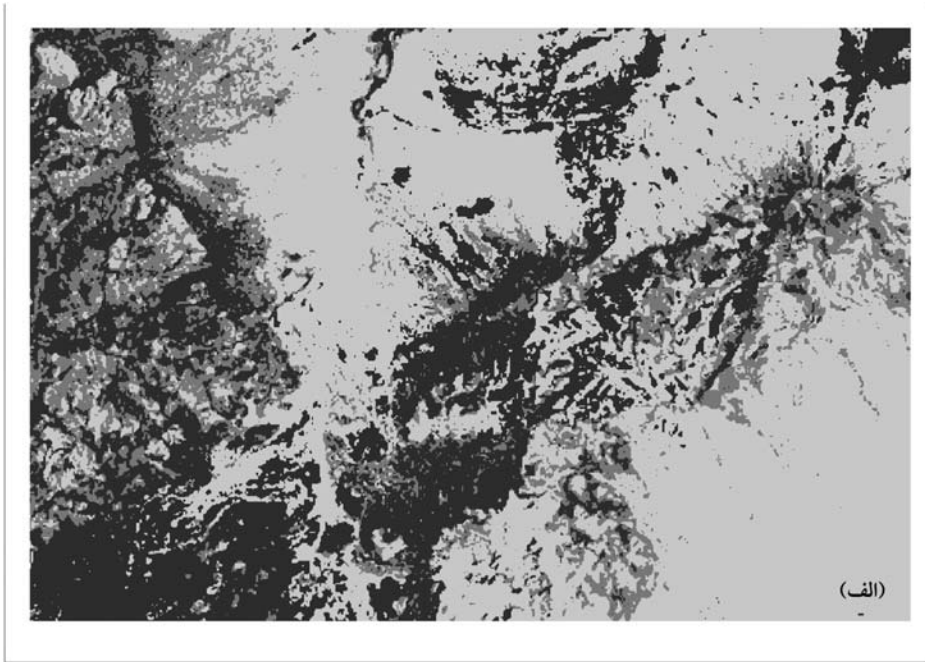
(%)	(%)		(%)			
/	/		/		ETM	
/	/	/	/		Ratio	
/	/		/		Ratio	
/	/	/	/		ETM , ETM	
/	/		/		Ratio , Ratio	
/	/		/		*TSAVI	

*Transformed Soil Adjustment Vegetation Index

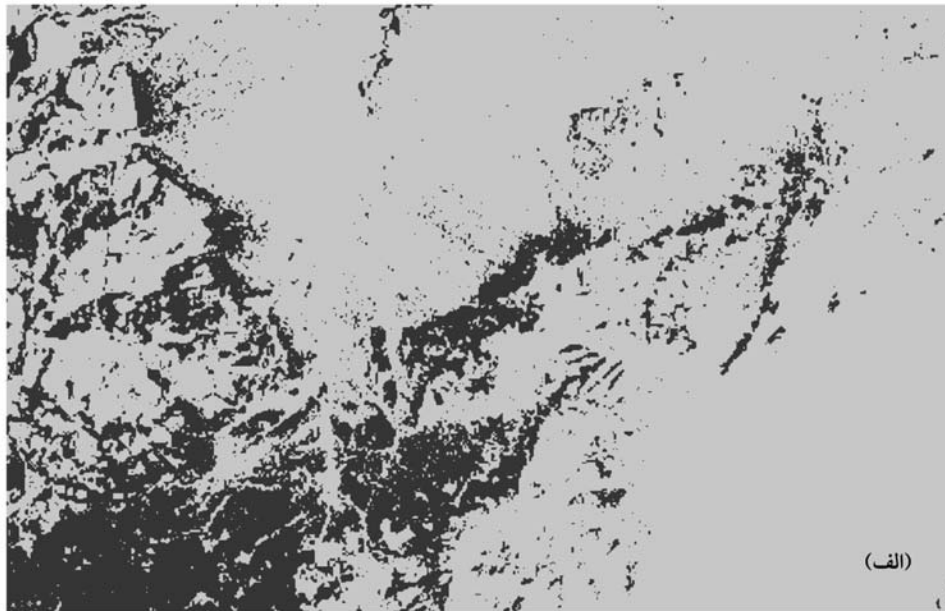
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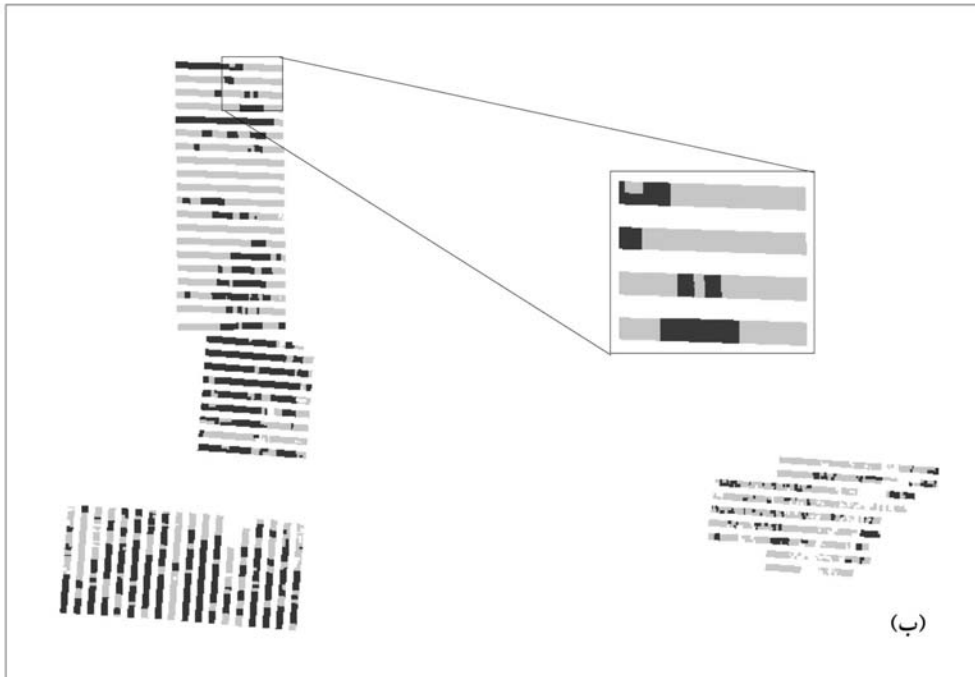
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- Linear Spectral Unmixing
 - Object – Based Method



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بسیار تنک-تنک
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An Evaluation of the Potential of Landsat ETM+ for Forest Density Mapping in Arid and Semi Arid Regions

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Abstract

Landsat-ETM+ data from the national park of Khabr in Kerman province, dating May 2000, were analyzed to investigate the potential of this sensor in forest density mapping in arid and semi-arid regions. The quality of the image was initially evaluated. No radiometric error was found. Orthorectification was implemented using ephemeris data, digital elevation model and 14 ground control points. The RMS error was less than half a pixel. The ground truth map allocating 50 percent of the total area was prepared through fieldwork using strip sampling. The best spectral bands were selected based on the divergence between class signatures using sample areas. The supervised, classification utilizing original and synthetic bands (resulted from band arithmetic, principal components analysis and tasseled cap transformation), maximum likelihood (ML), minimum distance to mean (MD), parallelepiped (PPD) and spectral angle mapper (SAM) classifiers, was performed. Within 3 density classes (very thin, thin and semi-dense) MD classifier exhibited the highest overall accuracy and kappa coefficient equal to 47.11% and 0.21 respectively. Signature separability, producer and user accuracies showed that the first and the second classes had the most spectral reflection similarity. By merging these two classes the classification was done again. In this case also, MD classifier showed the highest overall accuracy and kappa coefficient equal to 66.15% and 0.30 respectively. Based on these results, in such regions, low forest canopy increases the role of background reflection. High spatial resolution images and improved classification methods will demonstrate the potential of this application.

Keywords: ETM+, Orthorectification, Ground truth, Arid and semi-arid regions, Forest density mapping, Classification, Overall accuracy.

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