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ETM +

(GPS)

8

7

ETM7 ETM5 ETM1

ETM+

VNIR2

ETM5

HYB4

HYB4 VNIR2

ETM4

ETM+

Global Positioning System.

Fusion

SR: Spectral Response.

- HIS: Hue Intensity Saturation.

- SPSS

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Archive of SID

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3 - Waler et al..
4 - Moleele et al.

1- Vegetation Index
5 - Hardisky et al
2 - Anderson et al.
6- Xulin Guo and Price

Bromus

*Erutia Stipa barbata tomentellus
ceratoides*

*Agropyron trichophorum/ Onobrychis
melanotricha / Achillea aucheri
Poa bulbosa/ Astragalus cyclophyllus/
Scariola orientalis*

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ETM+

Pan

DGN



(×)

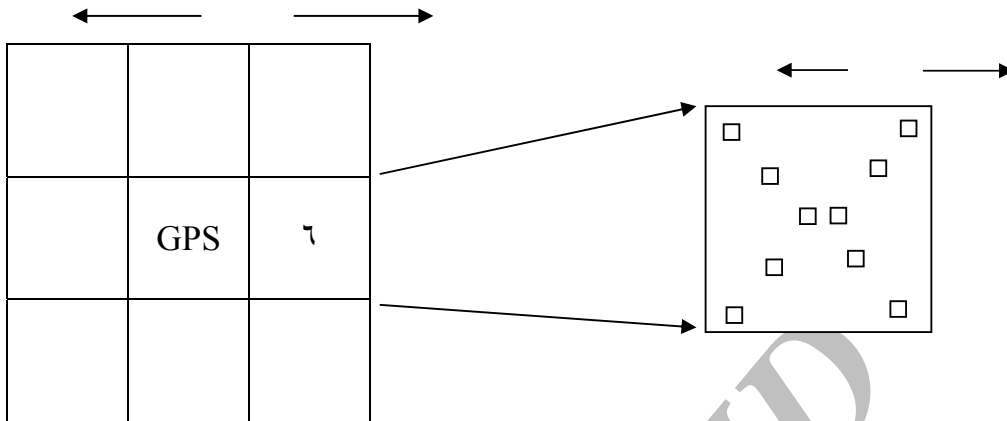
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ETM+

Archive of SID

1- Global Position System

2 - Double Sampling



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 ETM+
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 ETM1)
 ETM7 ETM5 ()
 ETM+ :
 :
 (RMS= /)
 NDVI
 ETM1 ²(DN)
 ETM7 ETM5
 IDRISI

3 - Soil Line

3- Histogram Minimum.
2 - Digital Number

...

$$Y = 0/89331 + 0/990025X \quad r = 0/99$$

$$Y = \text{ETM4}$$

$$X = \text{ETM3}$$

Archive of SID

Pan

ETM+

ETM2 ETM4

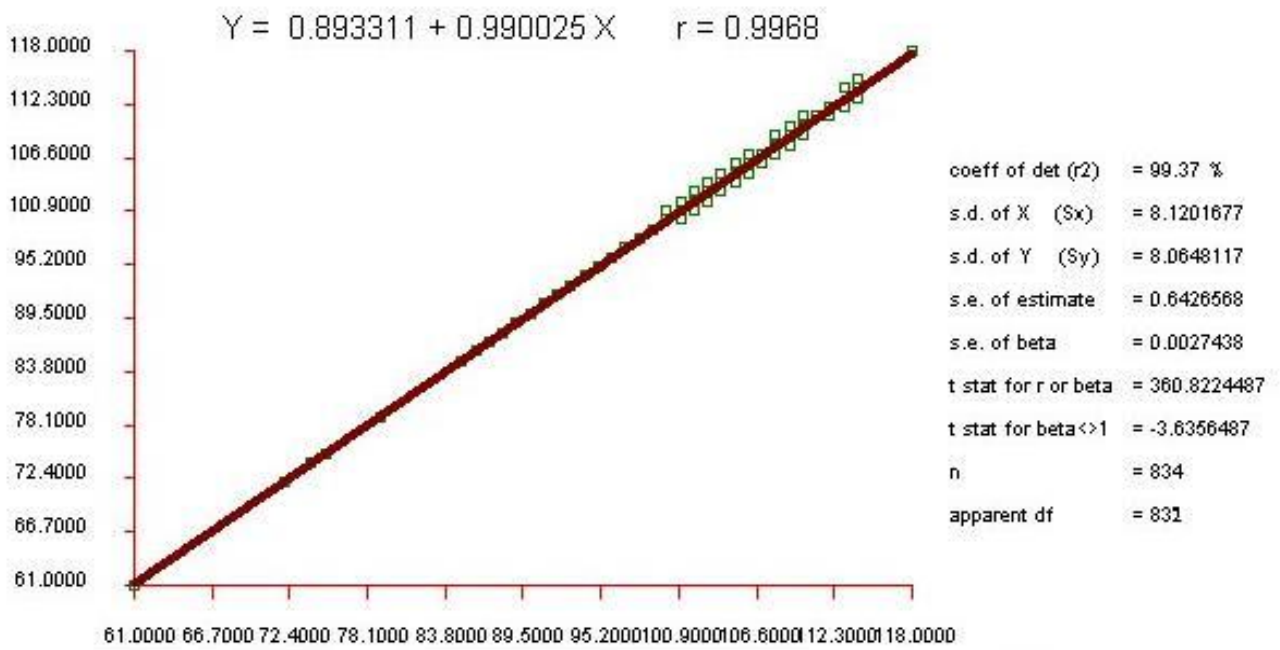
ETM-Pan

ETM7 ETM1

ETM-Pan

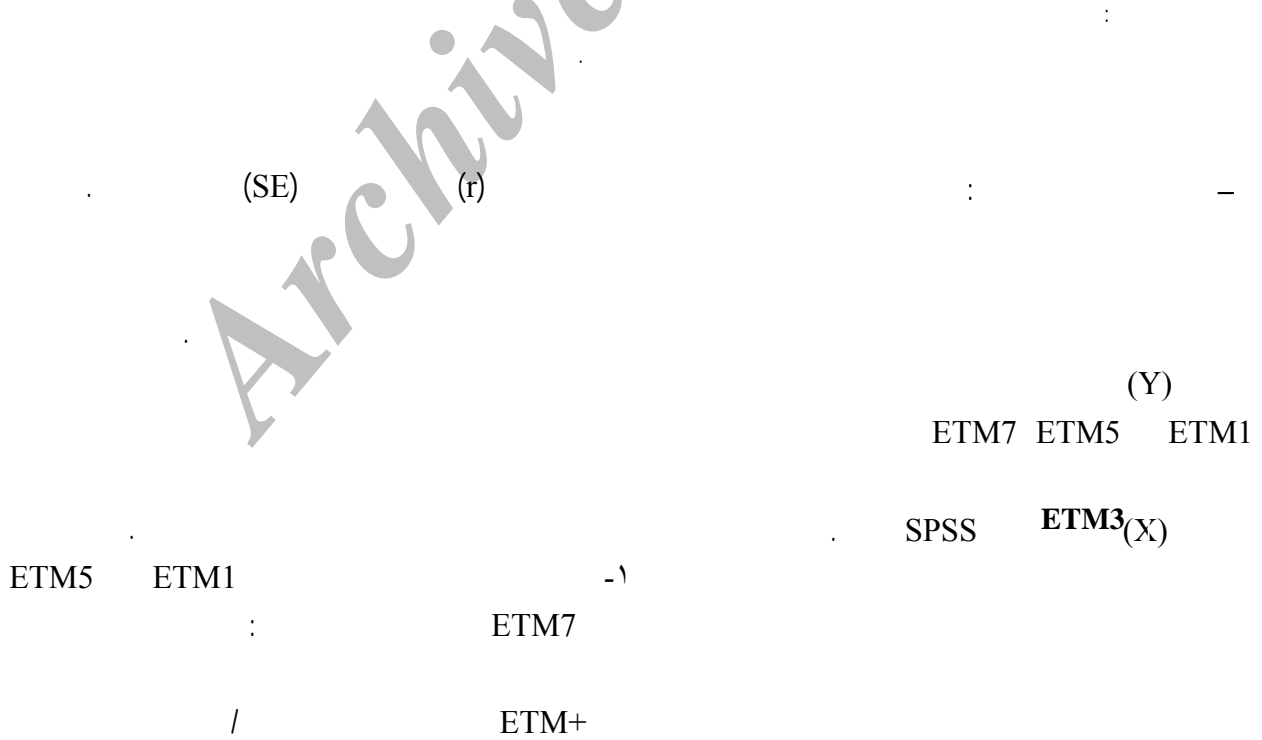
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1 -
3 - Dependent variable



ETM4

Archive 03



1- Independent variable

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(= /)

VNIR2) /

r / r = /) (

(= / ETM+)

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VNIR2

PCA(45)

= /) SAVI

(r = / r (r = /)

(r = /) PCA(45) (SE)

TSAVI₁

r /)

ETM4/ETM3	NIR
ETM4 - ETM3	DVI
(ETM4 - ETM1)/(ETM4 + ETM1)	VNIR1
(ETM4 - ETM2)/(ETM4 + ETM2)	VNIR2
(ETM4 - ETM3)/(ETM4 + ETM3)	NDVI
ETM4 - (1.2 * ETM3)/(ETM4 + ETM3)	MND
	Brightness
	Greenness
	PCA(123)
	PCA(45)
	PVI
$\left\{ \begin{array}{l} (ETM4 - ETM3) / (\sqrt{1 + a^2}) \\ (ETM4 - ETM3) / (ETM4 + ETM3 + L)(1 + L) \end{array} \right\}$ $\left. \begin{array}{l} L = 0.25 \\ L = 0.5 \\ L = 1 \end{array} \right\}$	SAVI
$\frac{(2 * (ETM4 + 1) - \sqrt{(2 * (ETM4 + 1))^2 - 8(ETM4 - ETM3)})}{2}$	MSAVI2
$\frac{(a * (ETM4 - (a * ETM3) - b))}{(ETM3 + (a * ETM4) - (a * b))}$	TSAVI 1
$\left\{ \frac{(a * (ETM4 - (a * ETM3) - b))}{0.08 * (ETM3 + (a * ETM4) - (a * b) + X(1 + a^2))} \right\}$	TSAVI2

(Pan)ETM8 ETM(1/2/3/4/5/7)	Fusion SR (2/3/4)
	Fusion IHS (1/2/3/4/5/7)

b a*

Fuse1

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(/ (r = / HYB4

Fuse1

/ / (/ r= /)

(SE = / r = /)

		r	SE
ETM1	72/3 -1/08X	0/46**	4/7
	3/2- 0/17X	0/37*	1/6
	27/8- 0/54X	0/47**	3/1
	187/3 - 3X	0/35*	7/9
ETM2	15/6 -0/77X	0/54**	4/4
	0/22- 0/12X	0/43*	1/8
	15/2- 0/37X	0/53**	2/6
	80/14 - 1/6X	0/3 ^{ns}	8
ETM3	42/5- 0/5X	0/53**	4/3
	1/64- 0/8X	0/44*	2/1
	12/6+0/26X	0/55**	2/6
	77/3- 1/16X	0/35*	8
ETM4	43/8 + 0/58X	0/66**	4
	0/9 + /97X	0/65**	1/8
	10/3 + 0/26X	0/55**	2/2
	94/5 + 1/5X	0/48**	9
ETM5	45/8- 0/52X	0/63**	4/1
	1/06 - 0/07X	0/46**	1/9
	-10/8 - 0/23X	0/6**	1/1
	83/2 - 1/17X	0/39*	7/6
ETM7	36/5 - 0/52X	0/64**	4/7
	2/9 - 0/7X	0/49**	1/9
	-5/7 - 0/23X	0/56**	2/6
	62/6 - 1/18X	0/4*	5

ns:

SE: =

r

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:x

%

:xx

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Archive of SID

HYB4

HYB4)

(%)

(ETM4

27.6±16.1	1.81 ^{ns}	2.31 [*]	2.1 ^{ns}	1.95 ^{ns}	ETM4
27.6 ± 17.2	2.03 ^{ns}	2.1 ^{ns}	3.05 ^{**}	2.02 ^{ns}	VNIR2
27.6±19	3.15 [*]	1.91 ^{ns}	2.95 ^{**}	2.05 ^{ns}	PCA (45)
27.6 ± 18.5	1.92 ^{ns}	1.99 ^{ns}	2.67 [*]	2.1 ^{ns}	SAVI
27.6±18.8	2.49 [*]	1.93 ^{ns}	3.7 ^{**}	2.04 ^{ns}	TSAVI
27.6±15.5	2.09 ^{ns}	1.86 ^{ns}	2.02 ^{ns}	1.98 ^{ns}	HYB4

: ns %

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ETM3

ETM+

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ETM4

MSAVI

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() NIR

TSAVI

() ()

MND NDVI

ETM4

MND NDVI

TSAVI

SAVI

()

SBI)

(r)

(GBI)

(

NDVI

...

HYB4)
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HYB4 (ETM4)
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(NIR)
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