

Earth, Planets and Space
Supplementary Information (Additional File)

**Investigation of the Relationship between Geomagnetic
Activity and Solar Wind Parameters Based on A Novel
Neural Network (Potential Learning)**

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Table S1: The values of all four measures (accuracy, precision, recall, and F-measure), their averages and numbers of true positives, false positives, true negatives, and false negatives in 10 patterns (models) at $r = 5$ and all equations to the four measures are summarized.

		Model output		Average of 10 patterns	
		Positive	Negative		
Actual	Positive	TP	FN	Accuracy	0.9875
	Negative	FP	TN	Precision	0.9867
				Recall	0.9883
				F-measure	0.9875

TP: True Positive, TN: True Negative

FP: False Positive, FN: False Negative

$$\text{Accuracy} = \frac{TP + TN}{TP + FP + FN + TN} \quad \text{Precision} = \frac{TP}{TP + FP}$$

$$\text{Recall} = \frac{TP}{TP + FN} \quad \text{F-measure} = \frac{2 \times \text{Precision} \times \text{Recall}}{\text{Precision} + \text{Recall}}$$

Data pattern 1		Model output			
		Positive	Negative		
Actual	Positive	119	1	Accuracy	0.9875
	Negative	2	118	Precision	0.9835
				Recall	0.9917
				F-measure	0.9876

Data pattern 2		Model output			
		Positive	Negative		
Actual	Positive	120	0	Accuracy	0.9917
	Negative	2	118	Precision	0.9836
				Recall	1.0000
				F-measure	0.9917

Data pattern 3		Model output			
		Positive	Negative		
Actual	Positive	119	1	Accuracy	0.9875
	Negative	2	118	Precision	0.9835
				Recall	0.9917
				F-measure	0.9876

Data pattern 4		Model output			
		Positive	Negative		
Actual	Positive	118	2	Accuracy	0.9875
	Negative	1	119	Precision	0.9916
				Recall	0.9833
				F-measure	0.9874

Data pattern 5		Model output	
		Positive	Negative
Actual	Positive	119	1
	Negative	2	118

Accuracy	0.9875
Precision	0.9835
Recall	0.9917
F-measure	0.9876

Data pattern 6		Model output	
		Positive	Negative
Actual	Positive	117	3
	Negative	2	118

Accuracy	0.9792
Precision	0.9832
Recall	0.9750
F-measure	0.9791

Data pattern 7		Model output	
		Positive	Negative
Actual	Positive	120	0
	Negative	2	118

Accuracy	0.9917
Precision	0.9836
Recall	1.0000
F-measure	0.9917

Data pattern 8		Model output	
		Positive	Negative
Actual	Positive	116	4
	Negative	2	118

Accuracy	0.9750
Precision	0.9831
Recall	0.9667
F-measure	0.9748

Data pattern 9		Model output	
		Positive	Negative
Actual	Positive	119	1
	Negative	0	120

Accuracy	0.995833
Precision	1
Recall	0.991667
F-measure	0.995816

Data pattern 10		Model output	
		Positive	Negative
Actual	Positive	119	1
	Negative	1	119

Accuracy	0.9917
Precision	0.9917
Recall	0.9917
F-measure	0.9917