

Figure 1: Clustering plots based on K-means algorithm in a 3-D space formed by PE, PPE and mean IF (a-c) and based on expert interpretation (d-f). Cluster 1 is associated with quiescence, cluster 2 is associated with dyke segments S1 to S4, and cluster 3 is associated with the eruption and presumed subglacial eruption. The border between cluster 1 and 3 by K-means are noticeably different compared to the border between quiescence and eruption according to the expert interpretation.

	K-Means	Cluster 1	Cluster 2	Cluster 3
Expert Interpretation				
Quiescence		0.950	$8.298 \times 10^{-5}$	0.049
Dyke Propagation (S1-S4)		0	0.964	0.036
Eruption and presumed subglacial eruption		0.232	0.013	0.755

Table 1: Confusion matrix between clusters formed by K-Means and the expert interpretation in Figure 1. The first row shows that 95% of the data points during quiescence are classified into cluster 1 and 5% are classified into cluster 3 and 2. The second row shows that 96% of the data points during the dyke propagation are classified into cluster 2 and 4% are classified into cluster 3. The third row shows that 23% of the data points during the eruption are classified into cluster 1, 76% are to cluster 3 and 1% are to cluster 2. The summation of values in each row is equal to 1.

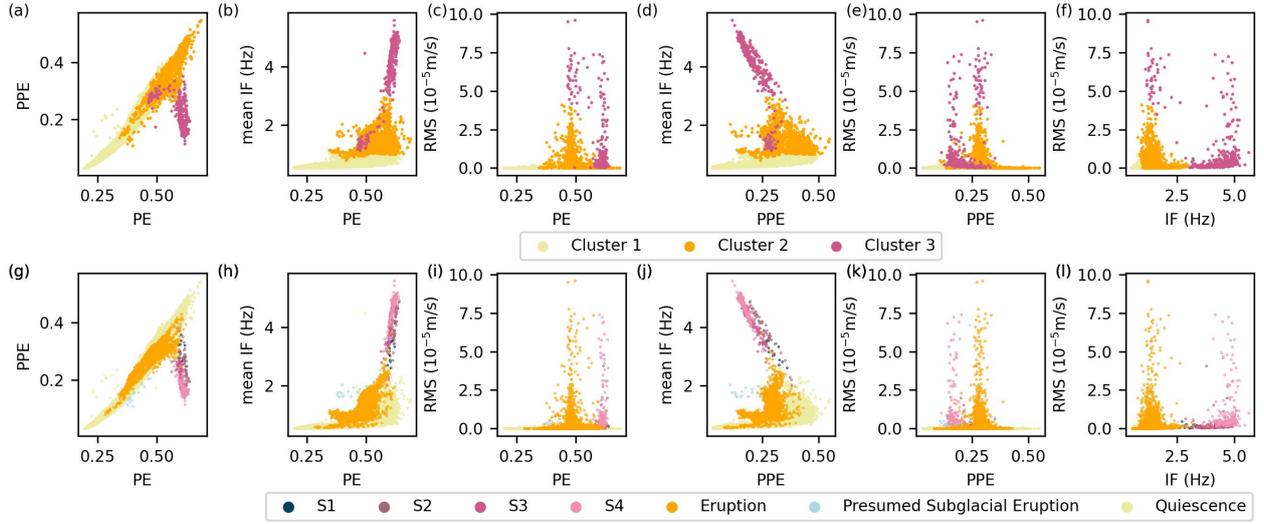


Figure 2: Clustering plots based on K-mean algorithm in a 4-D space formed by PE, PPE, IF and RMS (a-f) and based on expert interpretation (g-l). Cluster 1 is associated with quiescence, cluster 2 is associated with the eruption and presumed subglacial eruption, and cluster 3 is associated with dyke segments S1 to S4.

	K-Means		
Expert Interpretation	Cluster 1	Cluster 2	Cluster 3
Quiescence	0.953	0.046	$8.298 \times 10^{-5}$
Dyke Propagation (S1-S4)	0	0.036	0.964
Eruption and presumed subglacial eruption	0.234	0.744	0.022

Table 2: Confusion matrix between clusters formed by K-Means and the expert interpretation in Figure 2. The first row shows that 95% of the data points during quiescence are classified into cluster 1, and 5% are classified into cluster 2 and 3. The second row shows that 96% of the data points during the dyke propagation are classified into cluster 3, and the 4% are classified into cluster 2. The third row shows that 75% of the data points during the eruption are classified into cluster 2, 23% are classified to cluster 1 and 2% are classified to cluster 3. The summation of values in each row is equal to 1.

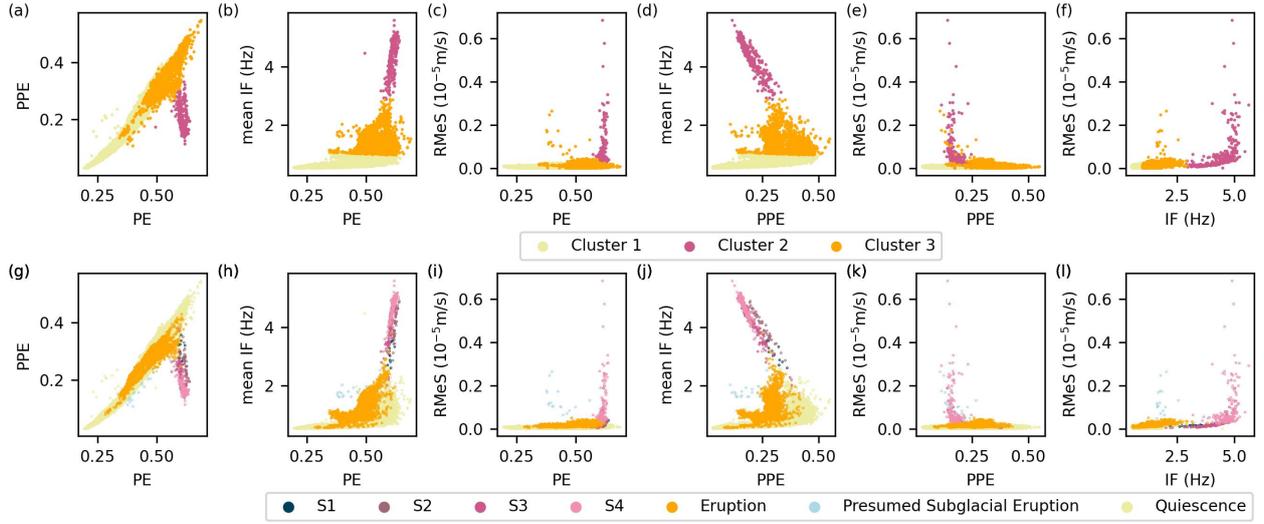


Figure 3: Same as Figure 2 but with RMeS instead of RMS. Cluster 1 is associated with quiescence, cluster 2 is associated with dyke segments S1 to S4, and cluster 3 is associated with the eruption and presumed subglacial eruption.

K-Means	Cluster 1	Cluster 2	Cluster 3
Expert Interpretation			
Quiescence	0.950	$8.298 \times 10^{-5}$	0.049
Dyke Propagation (S1-S4)	0	0.964	0.036
Eruption and presumed subglacial eruption	0.231	0.012	0.756

Table 3: Confusion matrix between clusters formed by K-Means and the expert interpretation in Figure 3. The first row shows that 95% of the data points during quiescence are classified into cluster 1 and 5% are classified into cluster 2 and 3. The second row shows that 96% of the data points during the dyke propagation are classified into cluster 2 and 4% are classified into cluster 3. The third row shows that 23% of the data points during the eruption are classified into cluster 1, 76% are classified to cluster 3 and 1% to cluster 2. The summation of values in each row is equal to 1.

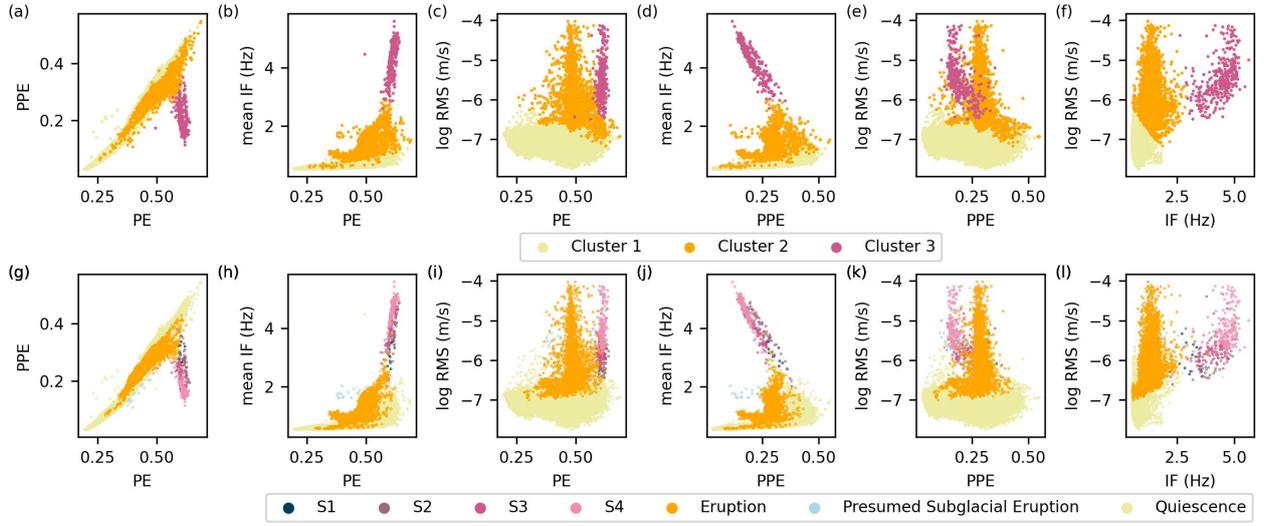


Figure 4: Same as Figure 2 but with  $\log(\text{RMS})$  instead of RMS. Cluster 1 is associated with quiescence, cluster 2 is associated with eruption and presumed subglacial eruption, and cluster 3 is associated with dyke segments S1 to S4.

Expert Interpretation	K-Means		
	Cluster 1	Cluster 2	Cluster 3
Quiescence	0.979	0.02	$8.298 \times 10^{-5}$
Dyke Propagation (S1-S4)	0	0.029	0.971
Eruption and presumed subglacial eruption	0.178	0.810	0.012

Table 4: Confusion matrix between clusters formed by K-Means and the expert interpretation in Figure 4. The first row shows that 98% of the data points during quiescence are classified into cluster 1 and 2% are classified into cluster 2 and 3. The second row shows that 97% of the data points during the dyke propagation are classified into cluster 3, and 3% into cluster 2. The third row shows that 81% of the data points during the eruption and presumed subglacial eruption are classified into cluster 2, 12% are classified to cluster 2 and 1% are classified to cluster 3. The summation of values in each row is equal to 1.

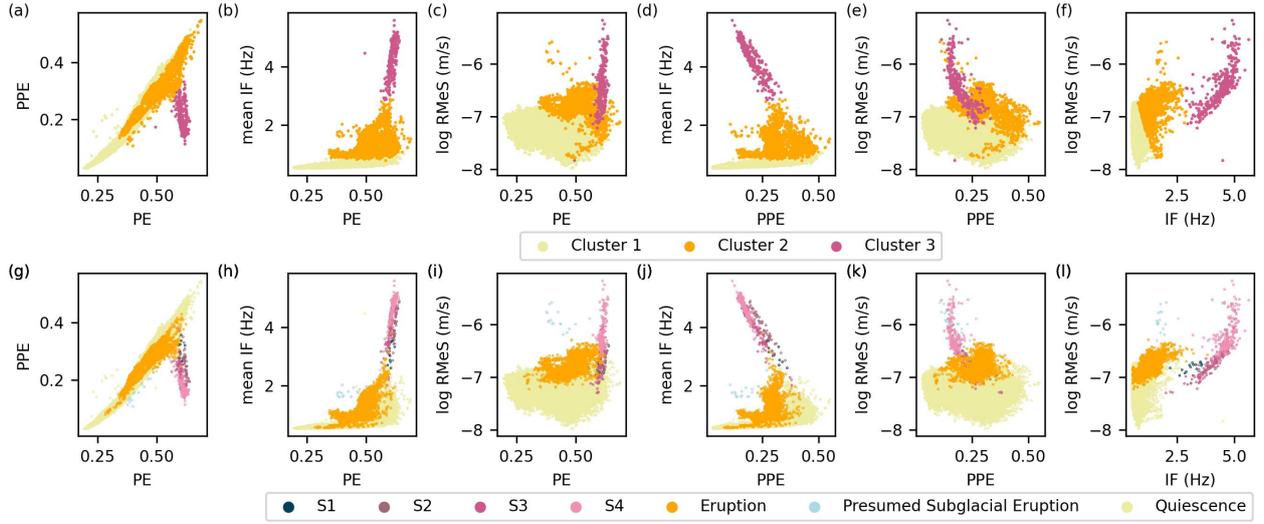


Figure 5: Same as Figure 2 but with  $\log(\text{RMeS})$  instead of RMS. Cluster 1 is associated with quiescence, cluster 2 is associated with the eruption and presumed sub-glacial eruption, and cluster 3 is associated with dyke segments S1 to S4.

K-Means	Cluster 1	Cluster 2	Cluster 3
Expert Interpretation			
Quiescence	0.962	0.037	$8.298 \times 10^{-5}$
Dyke Propagation (S1-S4)	0	0.036	0.964
Eruption and presumed subglacial eruption	0.122	0.865	0.013

Table 5: Confusion matrix between clusters formed by K-Means and the expert interpretation in Figure 5. The first row shows that 96% of the data points during quiescence are classified into cluster 1 and 4% are classified into cluster 2 and 3. The second row shows that 96% of the data points during the dyke propagation are classified into cluster 3 and 4% are classified into cluster 2. The third row shows that 87% of the data points during the eruption are classified into cluster 1, 12% are classified to cluster 2 and 1% are classified to cluster 3. The summation of values in each row is equal to 1.