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Dynamical changes in seismic properties prior to, during, and after the 2014–2015 Holuhraun eruption, Iceland

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

Table S1: Confusion matrix between clusters formed by K-means and the expert interpretation using PE, PPE and IF. It shows that 95% of the data points during quiescence are classified into cluster 1, 96.4% of the data points during the dyke propagation are classified into cluster 2, and 75.5% of the data points during the eruption are classified into cluster 3. The summation of values in each row is equal to 1.

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

Table S2: Confusion matrix between clusters formed by K-means and the expert interpretation using PE, PPE, IF and RMS. It shows that 95.3% of the data points during quiescence are classified into cluster 1, 96.4% of the data points during the dyke propagation are classified into cluster 3, and 74.4% of the data points during the eruption are classified into cluster 2. The summation of values in each row is equal to 1.

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

Table S3: Confusion matrix between clusters formed by K-means and the expert interpretation using PE, PPE, IF and RMeS. It shows that 95% of the data points during quiescence are classified into cluster 1, 96.4% of the data points during the dyke propagation are classified into cluster 2, and 75.6% during the eruption are classified to cluster 3. The summation of values in each row is equal to 1.

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

Table S4: Confusion matrix between clusters formed by K-means and the expert interpretation using PE, PPE, IF and log(RMS).. It shows that 97.9% of the data points during quiescence are classified into cluster 1, 97.1% of the data points during the dyke propagation are classified into cluster 3, and 81% of the data points during the eruption and presumed subglacial eruption are classified into cluster 2. The summation of values in each row is equal to 1.

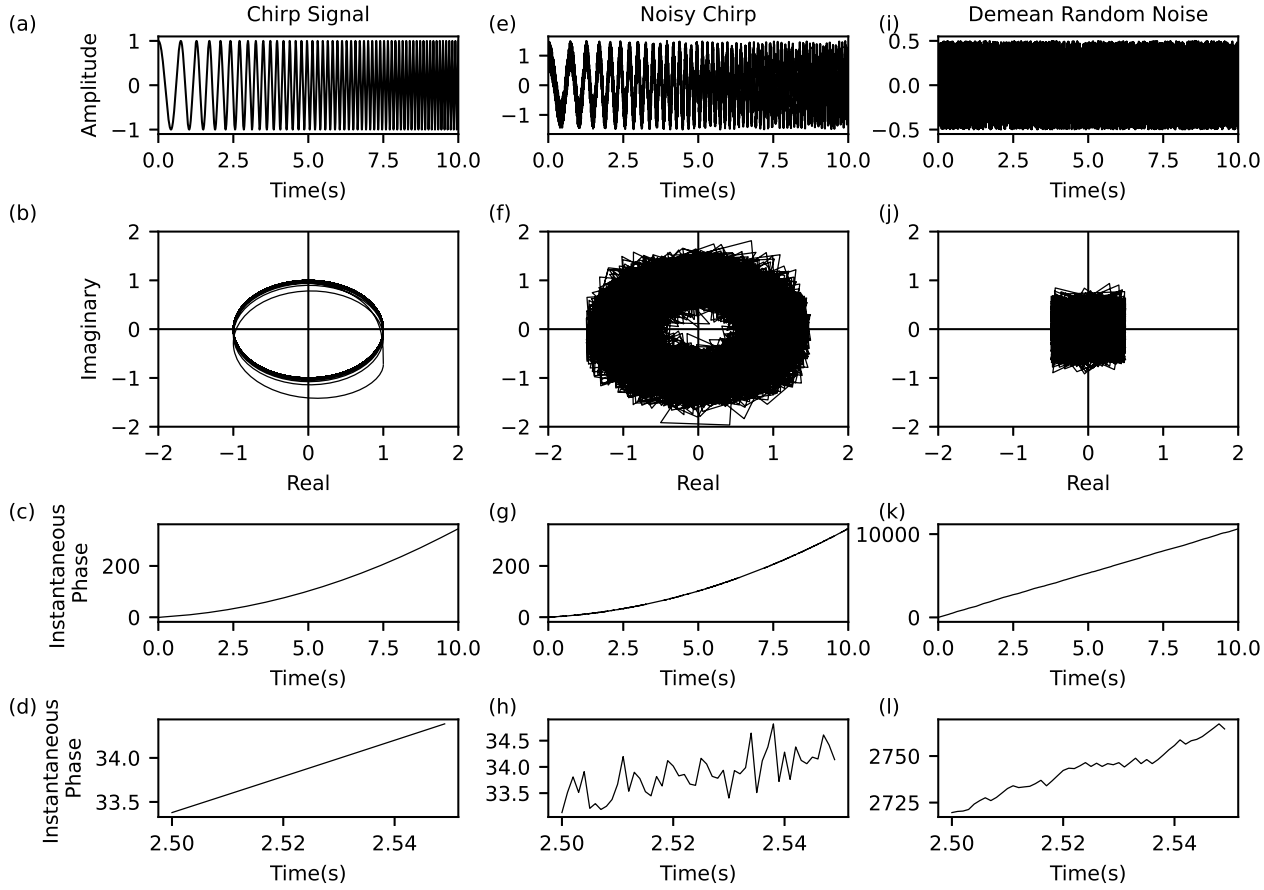

Figure S1: (a) Time series, (b) the analytical signal, (c) and the instantaneous phase (d) 0.5 s close up of the instantaneous phase for a synthetic chirp signal. (e-h) same as subfigure (a-d) for a noisy chirp and (i-l) same as subfigures (a-d) for noise.

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

Table S5: Confusion matrix between clusters formed by K-means and the expert interpretation using PE, PPE, IF and log(RMeS). The first row shows that 96.2% of the data points during quiescence are classified into cluster 1, 96.4% of the data points during the dyke propagation are classified into cluster 3, and 86.5% of the data points during the eruption are classified into cluster 2. The summation of values in each row is equal to 1.

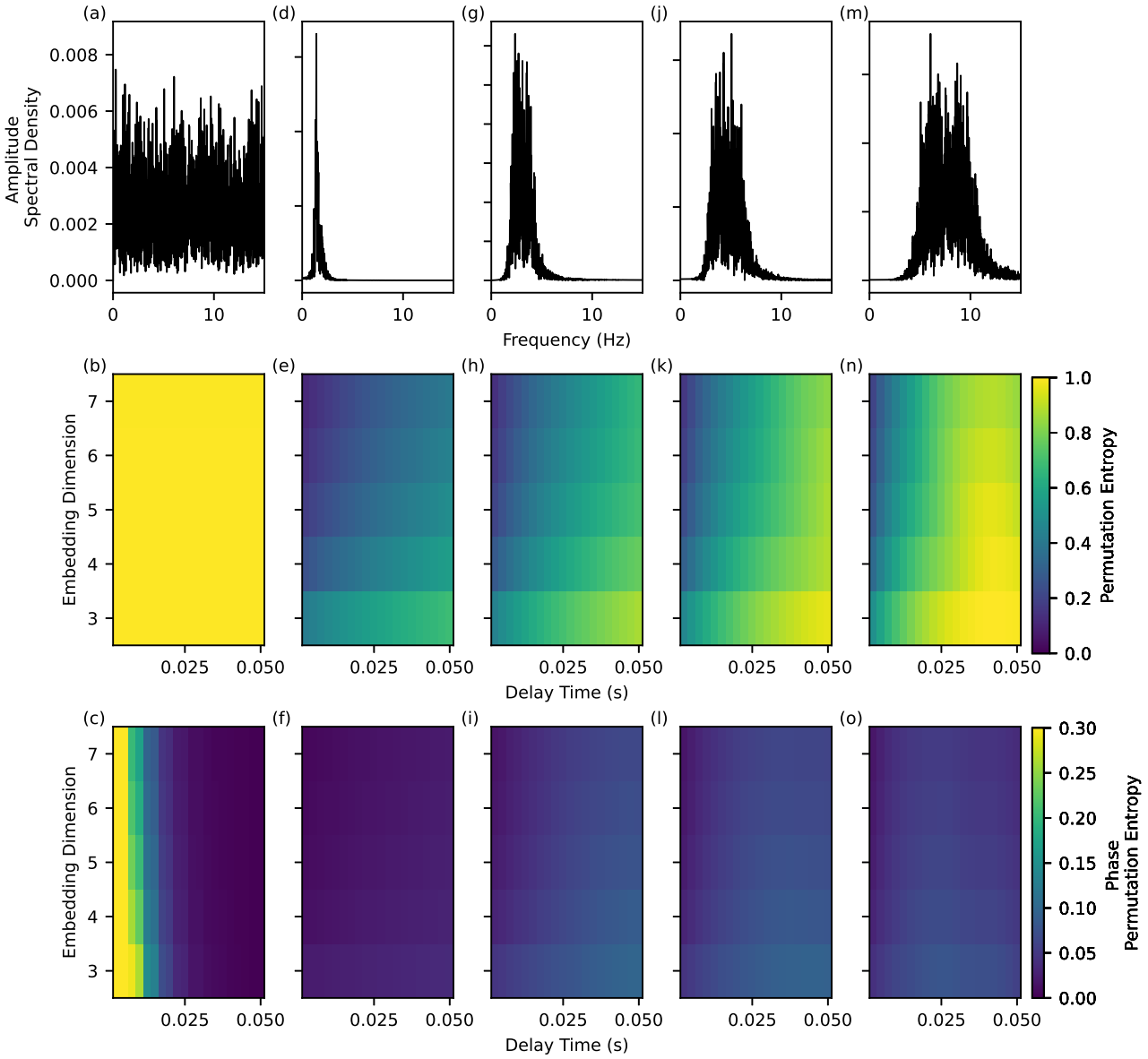

Figure S2: Noise in different frequencies spectrum and their corresponding PE and PPE, unfiltered random noise (a-c), 1-2 Hz (d-f), 2-4 Hz (g-i), 3-6 Hz (j-l), 5-10 Hz (m-o).

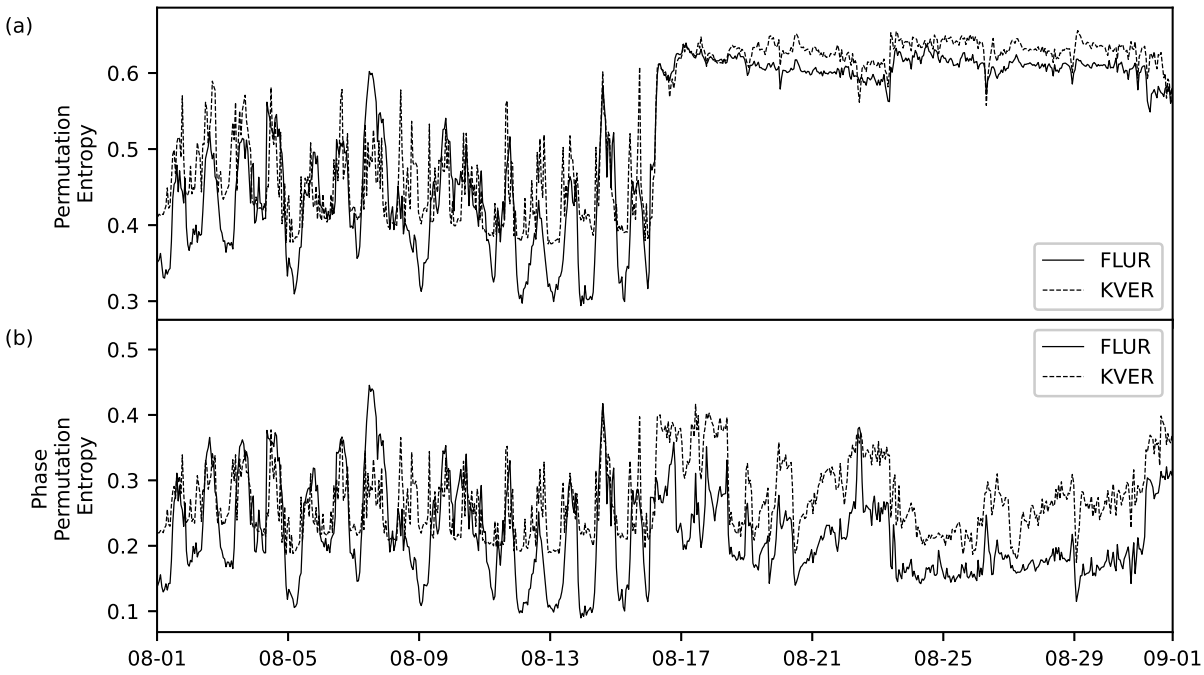

Figure S3: (a) PE and (b) PPE comparison between stations FLUR and KVER, both vertical components, bandpass-filtered from 0.5 to 10 Hz.

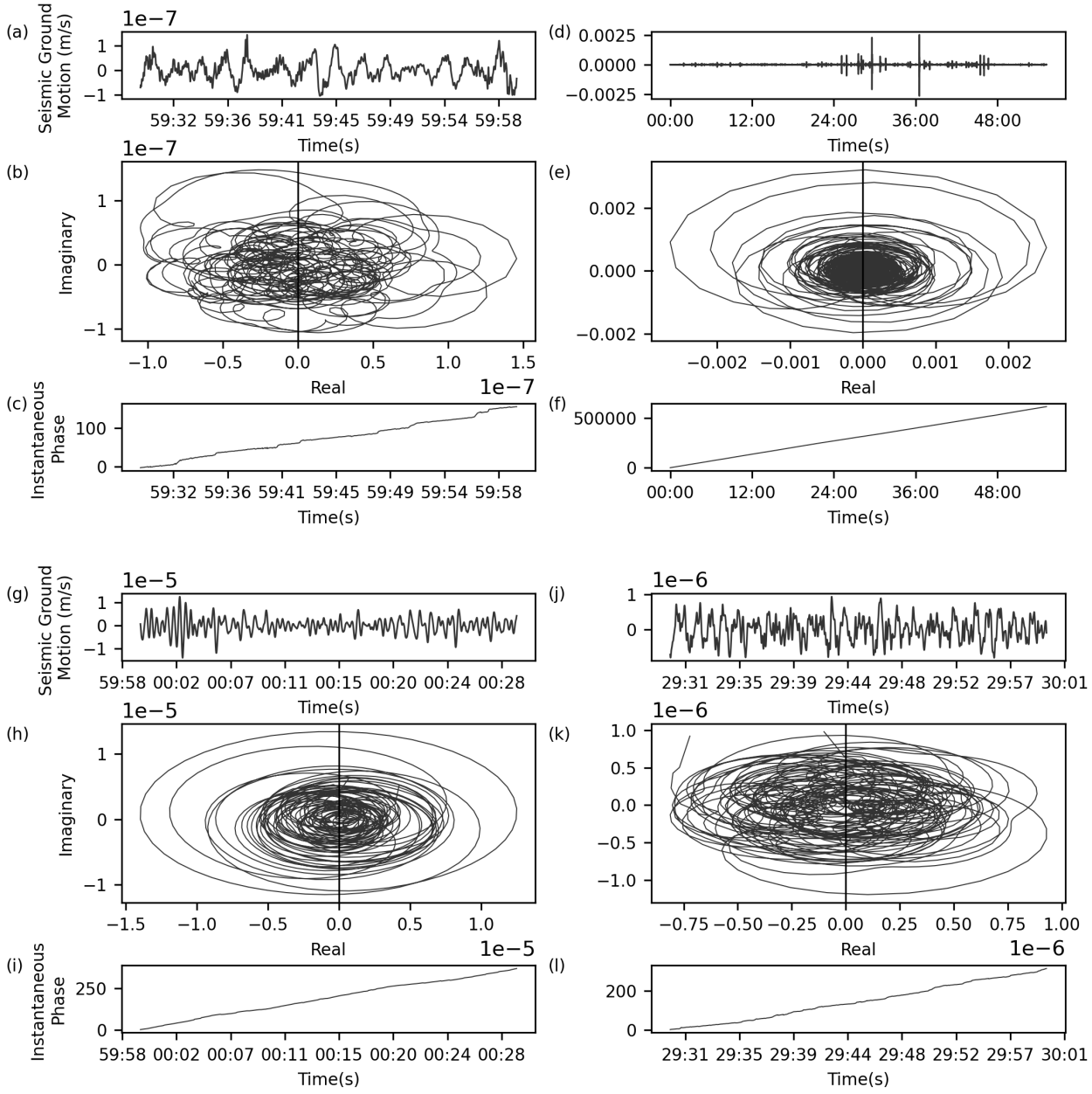

Figure S4: The comparison of the signal projection in the complex plane and its instantaneous phase for ambient noise on 17 June (a-c), VT events on 25 August (d-f), tremor on 3 September (g-i), and tremor on 10 September (j-l).

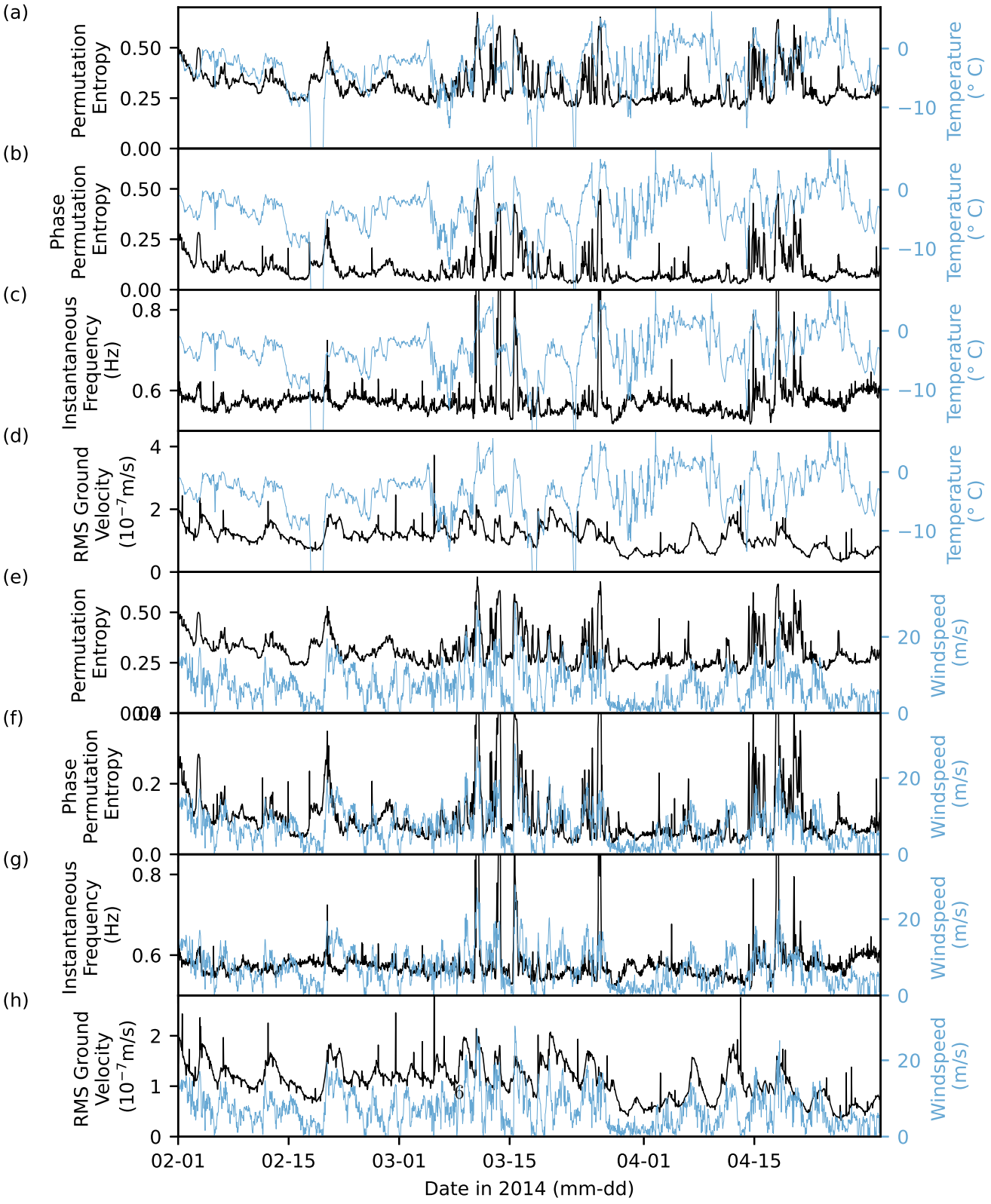

Figure S5: The comparison of air temperature with PE, PPE, IF, and RMS (a-d), and wind speed with the mentioned parameters (e-h) from February to April 2014.

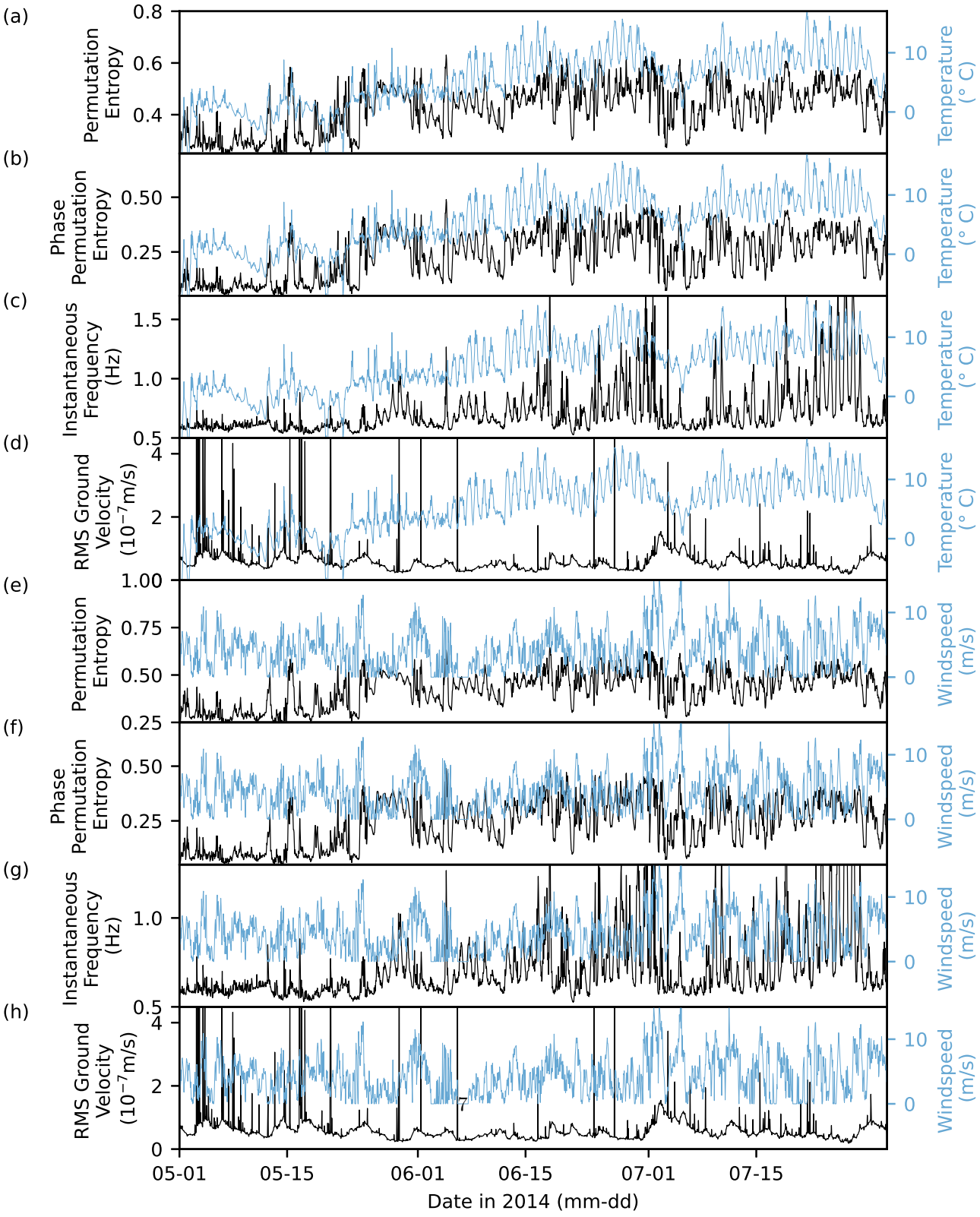

Figure S6: The comparison of air temperature with PE, PPE, IF, and RMS (a-d), and wind speed with the mentioned parameters (e-h) from May to July 2014.

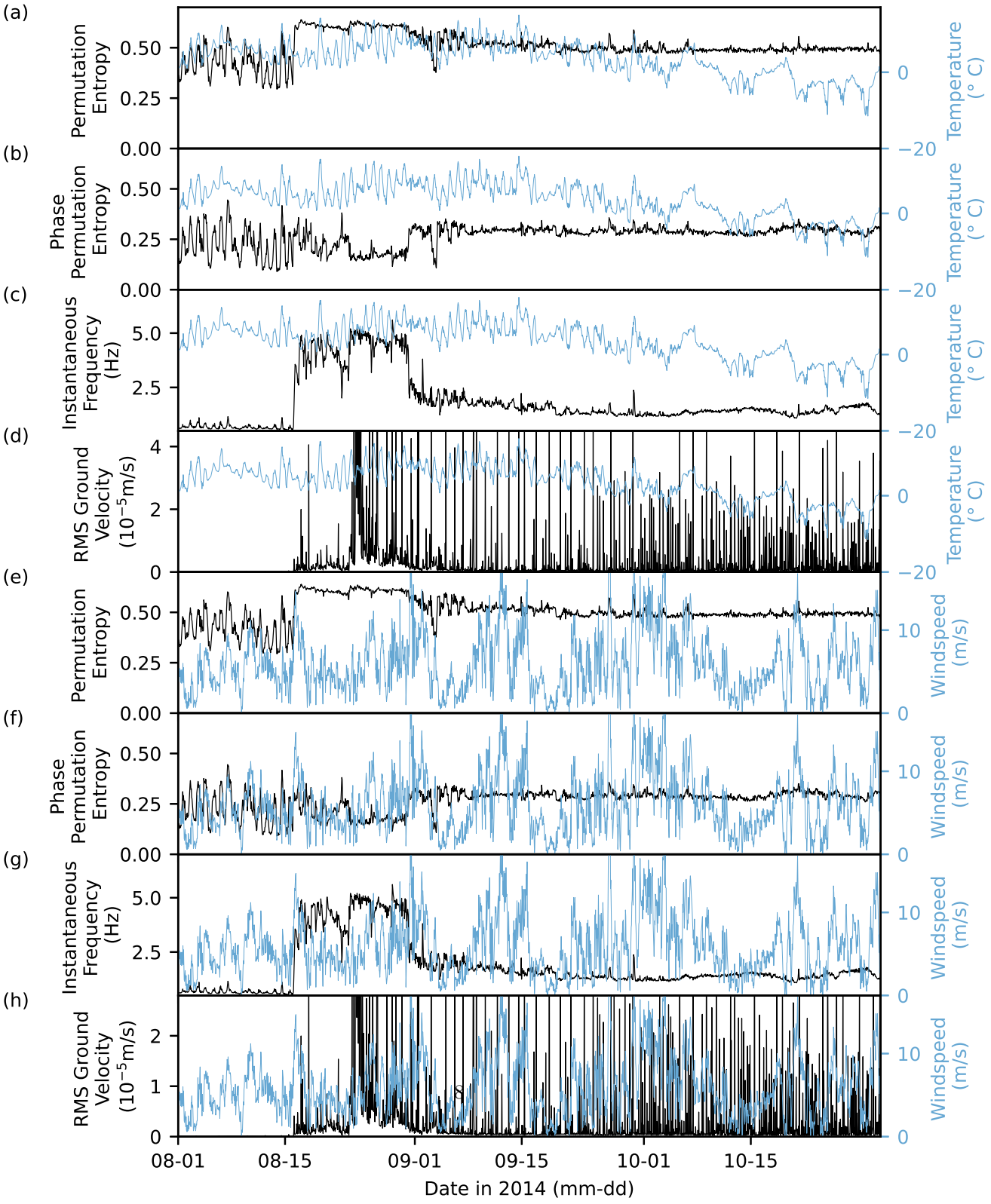

Figure S7: The comparison of air temperature with PE, PPE, IF, and RMS (a-d), and wind speed with the mentioned parameters (e-h) from August to October 2014.

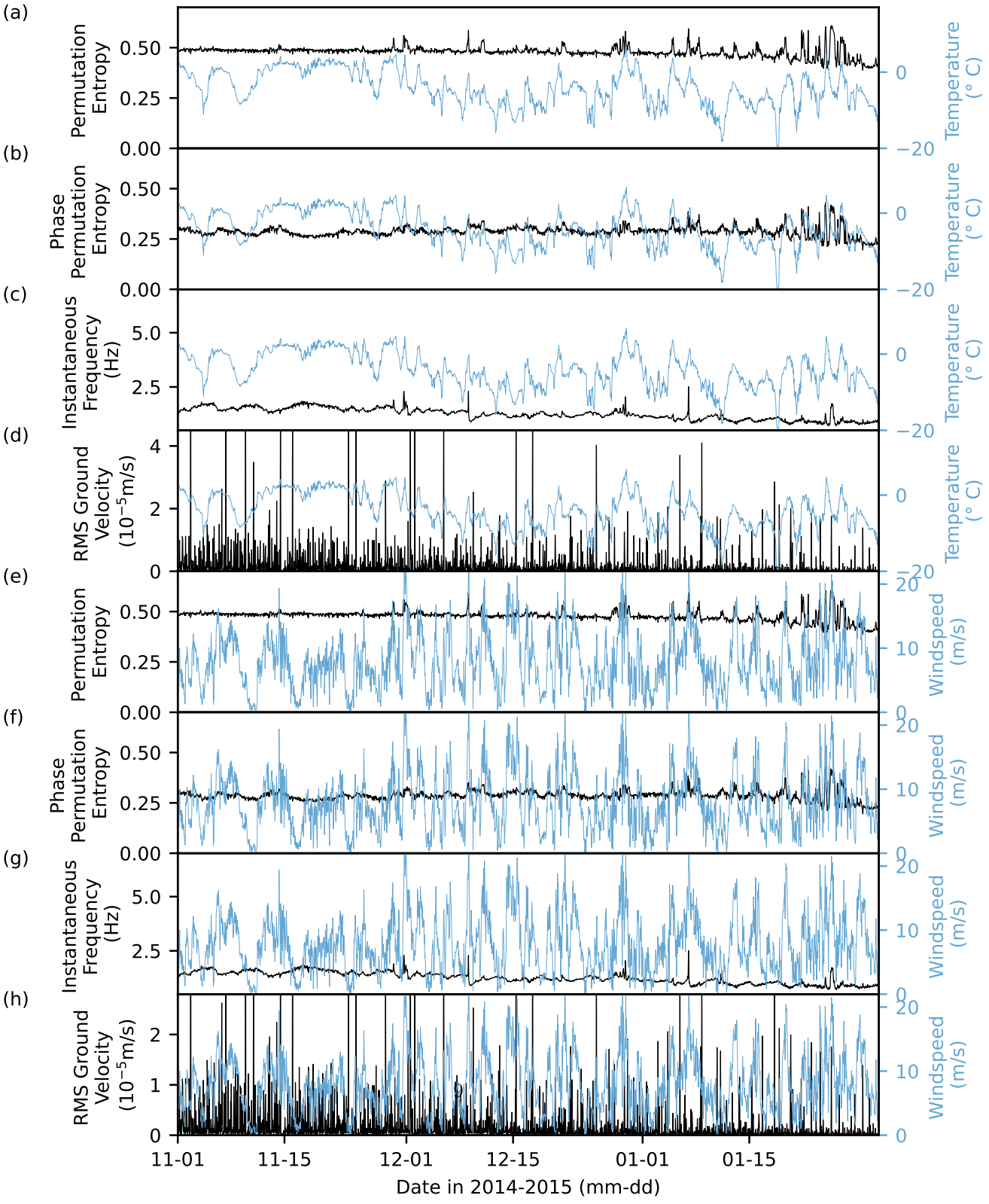

Figure S8: The comparison of air temperature with PE, PPE, IF, and RMS (a-d), and wind speed with the mentioned parameters (e-h) from November 2014 to January 2015.

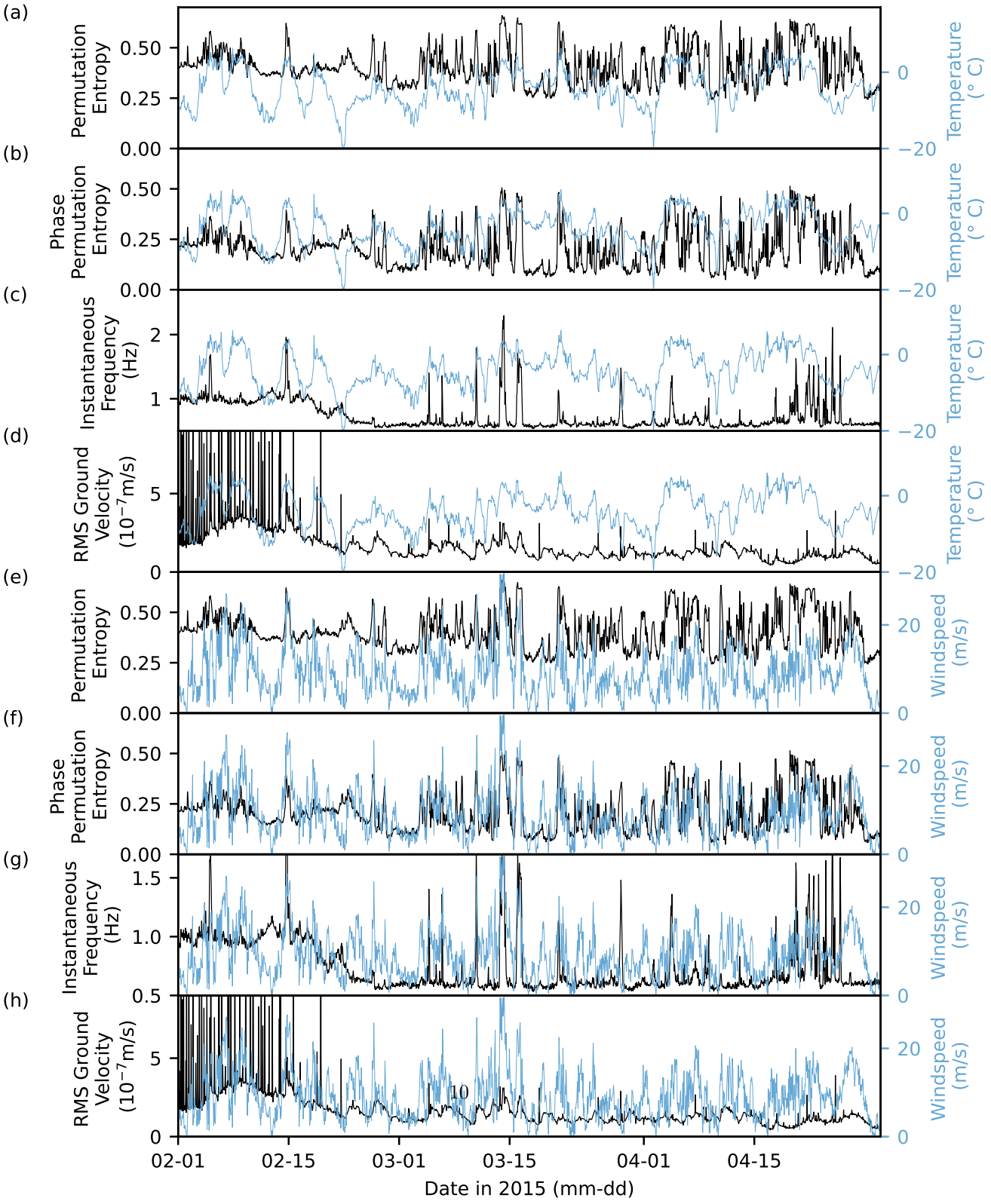

Figure S9: The comparison of air temperature with PE, PPE, IF, and RMS (a-d), and wind speed with the mentioned parameters (e-h) from February to April 2015.

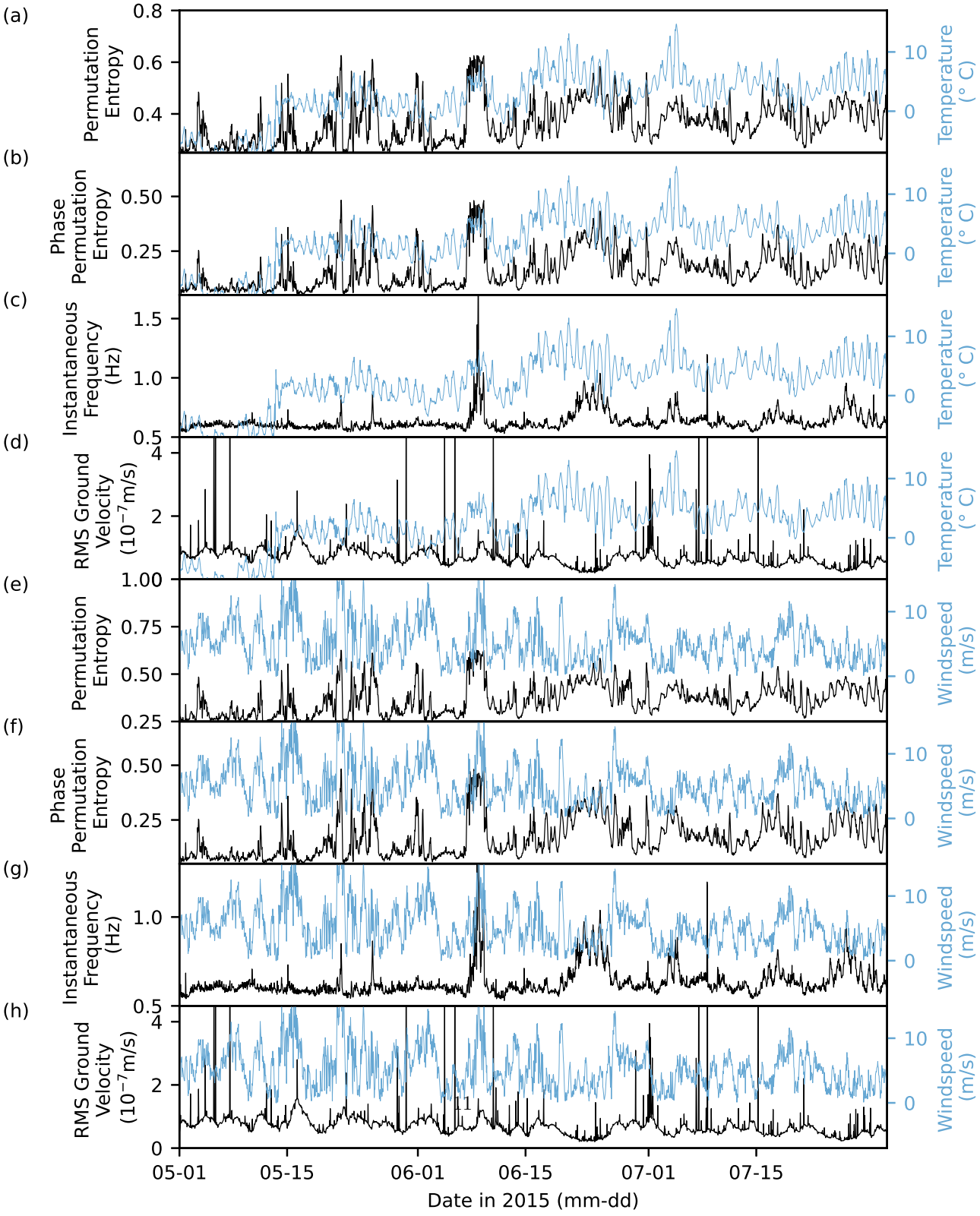

Figure S10: The comparison of air temperature with PE, PPE, IF, and RMS (a-d), and wind speed with the mentioned parameters (e-h) from May to July 2015.

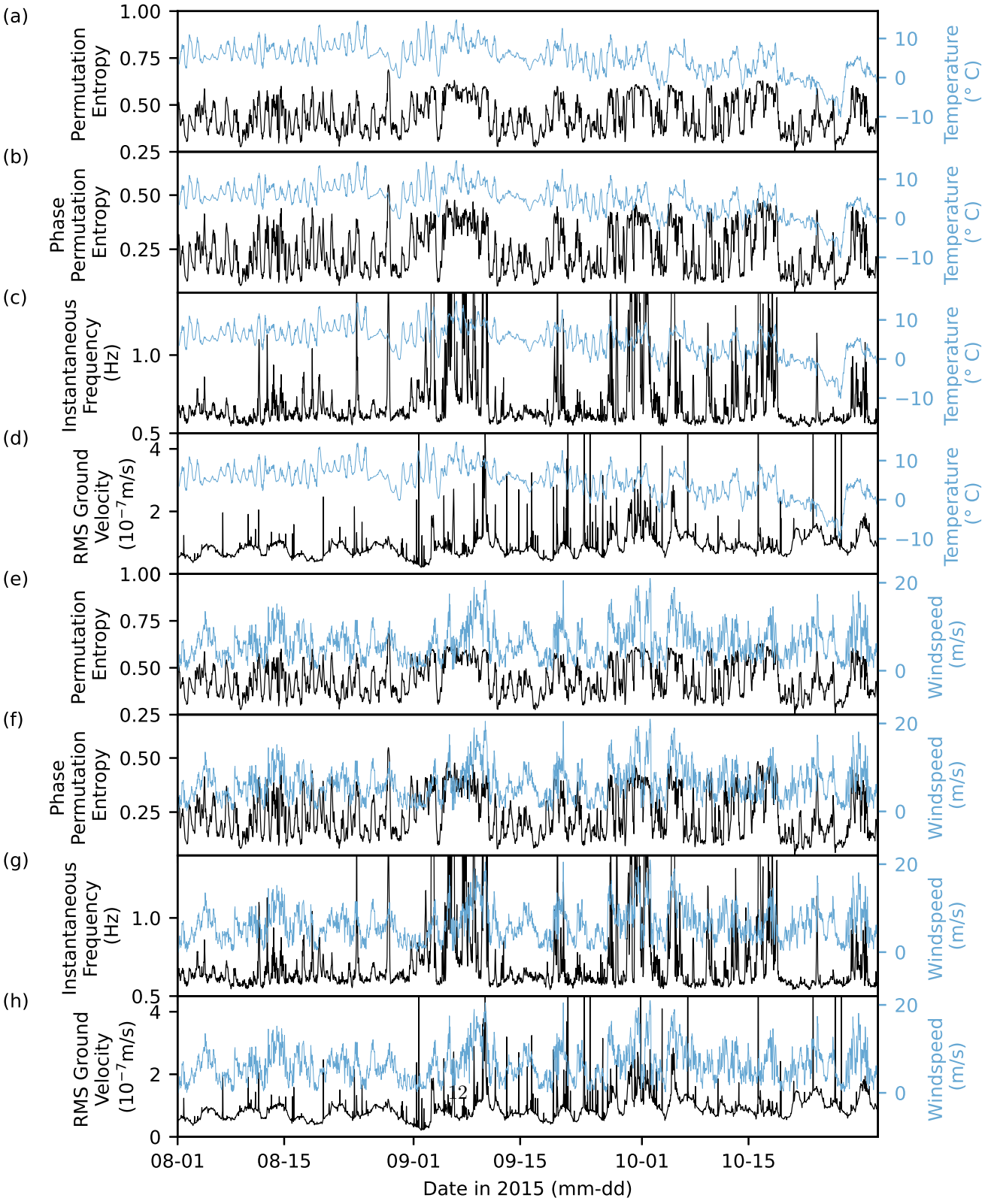

Figure S11: The comparison of air temperature with PE, PPE, IF, and RMS (a-d), and wind speed with the mentioned parameters (e-h) from August to October 2015.

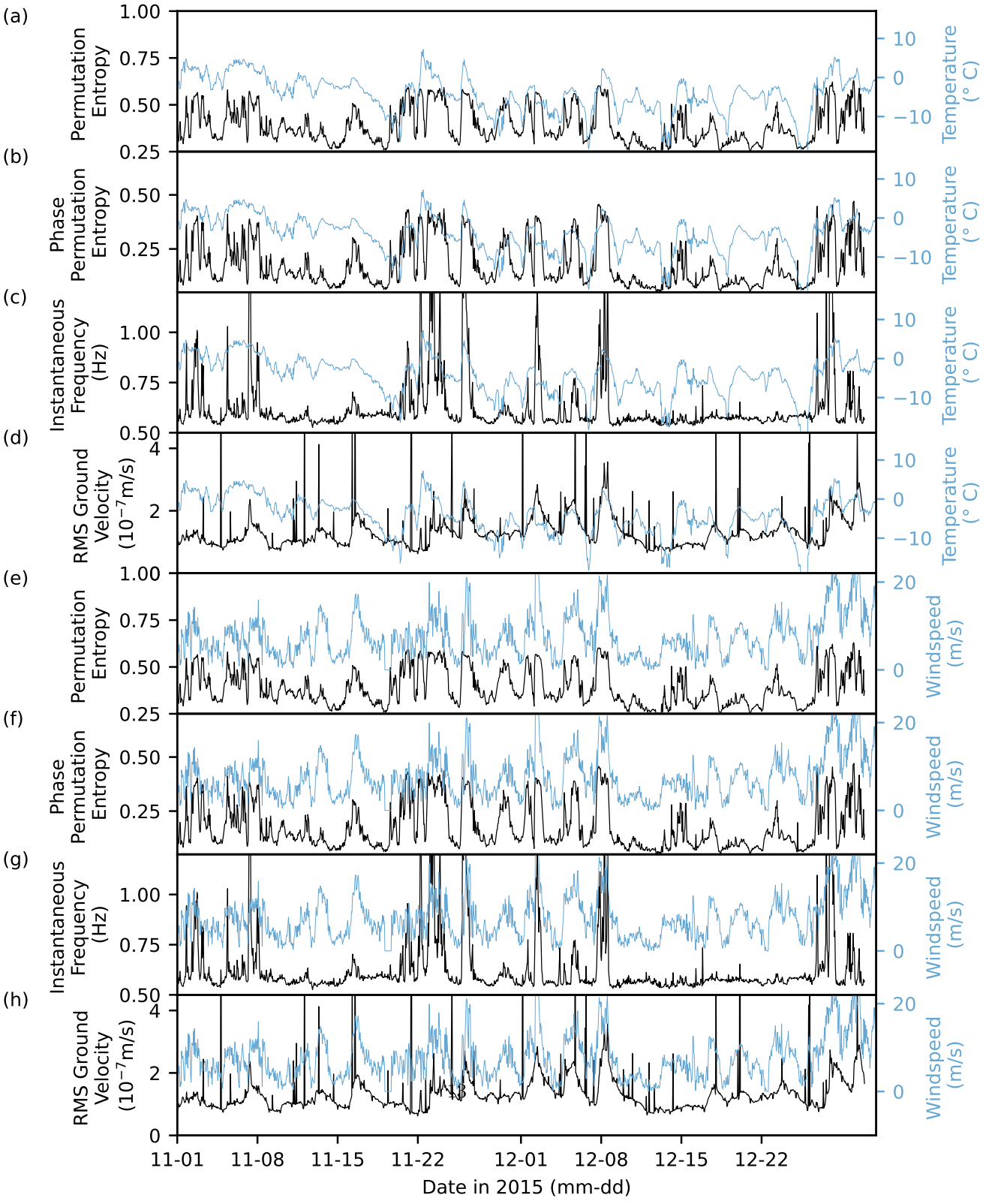

Figure S12: The comparison of air temperature with PE, PPE, IF, and RMS (a-d), and wind speed with the mentioned parameters (e-h) from November to December 2015.