MDPI Publications

Remote Sensing

Supporting Information for

Infrasound observations of atmospheric disturbances due to a sequence of explosive eruptions at Mt. Shinmoedake, Japan, in March

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Introduction

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- List of Infrasound Stations Operated since 2015 (Table S1);
- Specifications of the infrasound instrument (ADXII-INF01) (Table S2).
- A result set for trace velocity, sound speed and winds speed during sequence of eruption (Table S3-S7).

Station Code	Latitude (°N)	Longitude (°E)	Station Code	Latitude (°N)	Longitude (°E)
KUT00	33.6099	133.6916	**KUT16**	33.2680	134.1641
KUT01	33.0363	133.0311	**KUT17**	33.5278	133.7576
KUT02	33.0547	133.0461	**KUT19**	42.6022	141.4797
KUT03	33.0405	133.0563	**KUT20**	42.4988	143.4325
KUT04	32.9852	132.9988	**KUT21**	41.9361	143.2408
KUT05	33.0413	132.9713	**KUT30**	34.9650	136.6244
KUT06	35.7158	139.9441	**KUT31**	33.8883	136.1000
KUT07	32.9055	132.7180	**KUT32**	34.0705	136.1908
KUT08	32.7319	133.0186	**KUT33**	34.4875	136.7091
KUT09	32.4315	133.0186	**KUT34**	34.7691	137.3913
KUT10	32.7322	132.9944	**KUT35**	34.6001	138.2244
KUT11	33.4510	133.4417	**KUT40**	33.5709	131.2193
KUT12	33.5061	133.5111	**KUT41**	33.2844	131.4873
KUT13	33.5653	133.6673	**KUT51**	35.9657	140.6448
KUT14	33.5033	133.8794	**KUT53**	34.9848	139.8574
KUT15	33.5243	134.2809	**KUT60**	39.1949	141.8291

Table S1. List of Infrasound Stations Operated since 2015.

Integrated Accelerometer	
Measurement range	0–3347 Gal
Frequency characteristics	0.034–1600 Hz (N-S E-W), 0.034–550 Hz (V)
Resolution	16 bit
Audible Noise Sensor	
Measurement range	43–110 dB
Frequency characteristics	10–1,000 Hz
Auditory correction	None (= V characteristics)
Time constant	630 ms
Resolution	16 bit
Infrasound Sensor	
Measurement range	± 2.422 kPa
Minimum resolution	0.577 mPa
Noise level	± 20 mPa (Reduced to ± 1 mPa after passing through the 64th moving average filter)
D range	143.2 dB
Frequency characteristics	0.001 Hz to 6.25 Hz (± 6 dB temperature change low) 0.004 Hz to 6.25 Hz (± 6 dB temperature change high)
Pressure Sensor	
Measurement range	15–115 kPa
Frequency range	The lower of DC to 1 Hz or $F_s/2$ (F_s = sampling frequency)
Resolution	16 bit
Temperature Sensor	
Measurement range	0–81.92°C
Minimum resolution	0.0000390625°C
D range	128.18 dB

Table S2. Specifications of the infrasound instrument (ADXII-INF01).

trace velocity (km/s)	computed reflecting level (km)	speed of sound at reflecting level (km/s)	computed wind at reflecting level (m/s)
0.335	1.43992	0.325277818	9.722182119
0.335	1.51663	0.325274685	9.725315545
0.335	1.59605	0.325195798	9.804202034
0.335	1.6845	0.325160057	9.83994316
0.335	1.83236	0.325626272	9.373727642
0.3732	10.8367	0.316632885	56.56711539
0.3732	10.9657	0.315654214	57.54578584
0.3732	37.3657	0.30178093	71.41907002
0.3732	37.5416	0.298794697	74.40530354
0.3732	37.7365	0.297129246	76.07075431
0.3732	37.9515	0.295760593	77.43940752
0.3732	38.1866	0.294541827	78.65817264
0.3732	38.4431	0.293433228	79.76677169
0.3732	38.7222	0.292411739	80.78826056
0.3732	39.0255	0.291471553	81.7284467
0.3732	39.3568	0.290626862	82.57313816
0.3732	39.7272	0.289967581	83.23241873
0.3732	40.1652	0.289709429	83.49057104
0.3732	40.7612	0.290648088	82.55191233
0.3732	42.1918	0.297878168	75.32183238
0.3732	43.5031	0.296536556	76.66344415
0.3732	44.357	0.294886571	78.31342954
0.3732	45.1104	0.293690615	79.50938464
0.3732	45.9062	0.293385329	79.81467132
0.3732	46.9604	0.295442497	77.75750315

Table S3. Trace velocity, sound speed and winds speed for March 10th 2018 at 01:54 JST.

trace velocity (km/s)	computed reflecting level (km)	speed of sound at reflecting level (km/s)	computed wind at reflecting level (m/s)
0.3348	1.42946	0.325598916	9.201084137
0.3348	1.49758	0.325690738	9.109262193
0.3348	1.5636	0.325576043	9.223957085
0.3348	1.62898	0.325484421	9.315579014
0.3348	1.71553	0.325607258	9.192741898
0.3796	38.0356	0.304693914	74.90608578
0.3796	38.1918	0.302572334	77.02766643
0.3796	38.3599	0.300978453	78.62154739
0.3796	38.5411	0.299556019	80.0439815
0.3796	38.738	0.298241732	81.35826769
0.3796	38.9547	0.297028054	82.57194622
0.3796	39.1986	0.295935128	83.66487235
0.3796	39.48	0.294998002	84.60199795
0.3796	39.81	0.294245979	85.35402063
0.3796	40.2037	0.293754432	85.84556846
0.3796	40.6963	0.293704736	85.89526412
0.3796	41.348	0.294328155	85.27184474
0.3796	42.0873	0.294463136	85.136864
0.3796	42.7167	0.293427926	86.17207369
0.3796	43.2545	0.292187302	87.41269842
0.3796	43.7704	0.291113614	88.48638648
0.3796	44.3047	0.290312404	89.28759629
0.3796	44.8942	0.289979343	89.62065746
0.3796	45.6459	0.290964984	88.63501621
0.3796	65.1122	0.31464418	64.95581989
0.3796	65.8016	0.308333807	71.2661928

Table S4. Trace velocity, sound speed and winds speed for March 10th 2018 at 04:27 JST.

trace velocity (km/s)	computed reflecting level (km)	speed of sound at reflecting level (km/s)	computed wind at reflecting level (m/s)
0.3594	39.9089	0.290542614	68.85738557
0.3594	40.1616	0.28944729	69.95270985
0.3594	40.4331	0.288431978	70.96802162
0.3594	40.7267	0.28749141	71.90858995
0.3594	41.044	0.286626235	72.77376492
0.3594	41.3926	0.285874717	73.52528343
0.3594	41.7801	0.285279684	74.12031628
0.3594	42.2209	0.284937343	74.46265693
0.3594	42.7487	0.285056852	74.34314806
0.3594	43.4134	0.28588417	73.51583016
0.3594	44.2833	0.287671768	71.72823158
0.3594	45.528	0.291667995	67.73200548
0.3594	62.2862	0.315529086	43.8709137

Table S5. Trace velocity, sound speed and winds speed for March 10th 2018 at 10:15 JST.

trace velocity (km/s)	computed reflecting level (km)	speed of sound at reflecting level (km/s)	computed wind at reflecting level (m/s)
0.3679	10.7776	0.328495285	39.40471505
0.3679	10.8273	0.327257281	40.6427195
0.3679	10.8826	0.326234093	41.66590702
0.3679	10.944	0.32522469	42.67530961
0.3679	11.0124	0.324216955	43.68304501
0.3679	11.0891	0.323211611	44.68838862
0.3679	11.1755	0.322242417	45.65758303
0.3679	11.275	0.321332908	46.56709184
0.3679	11.3911	0.32053109	47.36890986
0.3679	11.5293	0.319916338	47.98366224
0.3679	11.7023	0.319664811	48.23518875
0.3679	11.941	0.320333731	47.56626937
0.3679	46.2706	0.309988674	57.91132581

Table S6. Trace velocity, sound speed and winds speed for March 12th 2018 at 12:45 JST.

trace velocity (km/s)	computed reflecting level (km)	speed of sound at reflecting level (km/s)	computed wind at reflecting level (m/s)
0.3785	1.5892	0.342010153	36.48984751
0.3785	10.3707	0.335842021	42.65797922
0.3785	10.4181	0.334839063	43.66093753
0.3785	10.4699	0.333887805	44.61219511
0.3785	10.5263	0.332931442	45.56855832
0.3785	10.5871	0.331952358	46.54764164
0.3785	10.6526	0.330949705	47.55029519
0.3785	10.7234	0.329921699	48.57830113
0.3785	10.7998	0.32888443	49.61556989
0.3785	10.8833	0.327843452	50.65654769
0.3785	10.9753	0.326828553	51.67144663
0.3785	11.079	0.325880891	52.61910928
0.3785	11.2001	0.32509027	53.40972982
0.3785	11.3528	0.324711471	53.78852881
0.3785	11.5795	0.325504806	52.99519392

Table S7. Trace velocity, sound speed and winds speed for March 15th 2018 at 14:13 JST.