

Item DR1

Photographs of the Southern Sector of Stromboli's Crater Terrace showing changes in observable bomb distribution in this sector between each of the six major explosions of 2009-2010

Major Explosion 1: 03/05/2009



Photo: DA518, 05/05/2009



Photo: DA468, 05/05/2009



Photo: DA462, 05/05/2009

Photographs of the southern sector of Stromboli's crater terrace following the first major explosion in the series (see Figure 1 for locations) show bombs with a maximum diameter of 100 cm scattered across this sector (photo DA518). Only one meter-scale bomb is obvious on the ridge that delimits the southern rim of the crater terrace (photo DA468); the crest of the ridge thus being largely free of bombs (photo DA462). As a result, the southern limit for the bomb distribution for major explosion 1 was defined by the southern rim of the crater terrace; Andronico (2009) mapped a distribution directed towards the NE, and not extending beyond the crater terrace southern rim.

Major Explosions 2 & 3: 08/11/2009 & 24/11/2009



Photo: DA0043, 29/11/2009



Photo: DA0042, 29/11/2009



Photo: DA0048, 29/11/2009

Photographs taken on 29 November 2009 show meter scale bombs littering the Pizzo (photo DA0042), as well as the tourist track that descends from the Pizzo to the south (see Figure 1 for locations). Meter-scale bombs are also scattered across the southern sector of the crater terrace, but the southern rim of the crater terrace is free of bombs (photographs DA0043 and DA0048). This led Andronico and Pistolesi (2010) to map the limit to the bomb distribution as an elliptical zone, elongated to the SE, with the southern rim of the crater terrace again marking its southern limit.

Major Explosions 4, 5 & 6: 10/01/2010, 21/01/2010 & 12/03/2010



Photo: AH4240, 07/06/2010



Photo: JD0849, 07/06/2010



Photo: AH4244, 07/06/2010

Although photographs taken in June 2010 show the large meter-scale bombs of the 24 November 2009 major explosion still in their same locations, many of the bombs towards the active craters have been buried by more recent tephra and only the largest bombs remain (partially) exposed (photo AH4240). Bombs on the southern, inner, flank of the crater terrace thus represent the largest, partially buried, bombs of the 24 November 2009, plus bombs from more recent events. Many new bombs, not apparent during the 29 November 2009 survey, can also be found in photographs taken along the crest of the ridge that delimits the southern rim of the crater terrace. This includes one very-easy-to-distinguish post-24 November bomb that drapes a prominent angular lithic that was emplaced during the 5 April 2003 paroxysm (photo JD0849). Comparison of Photographs acquired on 29 November 2009 and 07 June 2010 (c.f. photo DA0048 and photo AH4244) reveal that only one bomb from 24 November 2009 can be distinguished at the western end of the ridge that delimits the crater terrace's southern rim; all other bombs apparent in the June 2010 photographs were thus deposited after the 29 November 2009 photograph we assume during the 21 January 2010 explosion.

Note: While the explosion of 10 January 2010 was the only explosion from the NE crater (all others being from the Central Crater) and directed bombs to the NE, that of 12 March 2010 also directed bombs to the NE and was much weaker (in terms of pressure) than all other explosions (except that of 8 November 2009, see Table 1). Thermal video of the 21 January 2010 explosion shows it to be the only explosion with a direction to the S (see Supporting Material 3). We thus attribute the majority of the deposit in our mapped sector to the 21 January 2010 explosion.

Summation

We thus assume that:

- (i) Bombs emplaced across the southern sector of the crater terrace are a mixture of 24 November 2009 and 21 January 2010. However, because all but the largest bombs of 24 November 2009 had been buried by subsequent tephra fall by the time of measurement (June 2010), the measured mixture is dominated by 21 January 2010 bombs.
- (ii) Bombs along the crest of the ridge that delimits the crater terrace's southern rim are dominated by 21 January 2010 deposition, two or three bombs may come from the 24 November 2009 or 03 May 2009 events.
- (iii) With one or two exceptions, because bombs from just the 21 January 2010 event made it to the crest of the ridge that delimits the crater terrace's southern rim, the bomb field mapped on the southern outer flank of the crater terrace is dominated by bombs from the 21 January 2010 explosion.
- (iv) Because only one bomb from 24 November 2009 was found at the western end of the crater terraced (south) ridge, bombs to the west and south of this location are from 21 January 2010.
- (v) As we approach, and move across, the tourist path that descends from the Pizzo to the south, we move into the bomb field from the 24 November 2009 explosion, as mapped by Andronico and Pistolesi (2010), with a ~100 m wide zone to the west of this path representing overlap between the two bomb fields (i.e., those of 24 November 2009 and 21 January 2010, see Figure 1)

References:

- Andronico, D., 2009, Il parossismo eruttivo di Stromboli del 3 maggio 2009: osservazioni di campagna svolte nei giorni successive. INGV-Catania Internal Report (Catania, Italy), Prot. int. no. UFVG2009/20, 7 p.
- Andronico, D., and Pistolesi, M., 2010, The November 2009 paroxysmal explosions at Stromboli. *Journal of Volcanology and Geothermal Research*, v. 196, p. 120-125.

Item DR2

Bomb Field Data

Dimension, location, area, volume and mass data for the 780 bombs mapped across the southern sector of Stromboli's summit area during June 2010 and June 2011. While bombs associated with the 21 January 2010 SSE lobe are given against a yellow background, those associated with the 21 January 2010 SW lobe are given against an orange background (following the color convention used in Figure 1). Bombs associated with the 24 November 2009 eruption are given against a purple background.

Statistical summaries of each zone are given as a separate table at the end of the data base.

Bomb	Long Axis (cm)	Short Axis (cm)	Full GPS – E (UTM)	Full GPS – N (UTM)	Area (cm ²)	Volume (cm ³)	Weight (g)
1	28	22	518554	4293716	410	1820	3294
2	27	15	518545	4293705	361	1026	1856
3	45	30	518543	4293700	605	5321	9632
4	67	45	518538	4293698	2648	15968	28902
5	45	19	518533	4293695	833	2849	5157
6	50	32	518539	4293687	972	6713	12151
7	65	54	518531	4293686	1974	19658	35581
8	23	18	518529	4293691	333	1057	1913
9	20	8	518528	4293691	155	288	521
10	25	19	518528	4293691	354	1275	2308
11	134	88	518526	4293690	5105	103106	186622
12	30	20	518519	4293683	470	1755	3177
13	32	18	518520	4293687	438	1660	3005
14	31	11	518515	4293688	182	811	1467
15	100	41	518506	4293688	1400	24312	44005
16	132	62	518501	4293678	4252	62568	113248
17	44	16	518497	4293676	337	2184	3954
18	16	8	518497	4293676	68	212	384
19	42	33	518496	4293674	946	5516	9985
20	19	15	518496	4293674	202	634	1148
21	27	23	518495	4293676	433	1840	3330
22	34	17	518494	4293675	457	1668	3019
23	74	28	518490	4293673	2214	9560	17304
24	23	16	518477	4293671	260	900	1628
25	26	20	518477	4293671	359	1443	2613
26	78	26	518476	4293670	990	9284	16804

27	25	24	518476	4293669	534	1755	3177
28	57	30	518469	4293676	1248	7352	13308
29	56	48	518461	4293675	1496	13648	24703
30	54	33	518449	4293669	1238	7779	14080
31	77	51	518447	4293673	3107	22920	41486
32	63	43	518446	4293676	2519	13794	24967
33	66	49	518444	4293672	2726	17575	31811
34	33	23	518445	4293671	516	2421	4382
35	82	44	518443	4293677	2528	20413	36947
36	88	65	518442	4293671	2065	38335	69386
37	97	64	518441	4293673	3182	42877	77607
38	17	15	518439	4293670	183	545	986
39	61	59	518438	4293666	1119	20343	36821
40	76	56	518436	4293667	1609	25586	46311
41	126	75	518430	4293668	4460	76170	137867
42	34	25	518426	4293671	686	2827	5116
43	42	32	518423	4293670	1014	5289	9573
44	39	28	518413	4293670	676	3982	7207
45	30	9	518412	4293672	251	589	1066
46	18	16	518404	4293669	161	643	1164
47	38	15	518392	4293670	419	1636	2962
48	20	15	518394	4293669	221	680	1231
49	25	13	518383	4293667	239	759	1374
50	35	20	518381	4293671	487	2167	3923
51	91	44	518371	4293679	3263	23537	42602
52	29	19	518371	4293679	552	1562	2828
53	93	49	518368	4293679	3351	28093	50847
54	64	45	518367	4293681	2099	14998	27147
55	30	23	518365	4293676	472	2125	3847
56	87	87	518436	4293682	4695	56228	101773
57	144	100	518430	4293677	8810	135506	245265
58	204	102	518436	4293677	5832	224178	405762
59	34	22	518436	4293670	479	2373	4295
60	32	22	518442	4293665	491	2184	3954
61	150	45	518448	4293664	4197	48077	87019
62	58	24	518442	4293661	1058	5549	10044
63	82	40	518438	4293661	1846	17918	32432
64	105	44	518434	4293658	2919	28625	51811
65	24	24	518436	4293656	395	1660	3005
66	25	12	518437	4293656	332	680	1231
67	16	12	518437	4293656	84	370	669
68	28	28	518456	4293652	239	2531	4581
69	52	22	518452	4293652	800	4243	7680

70	32	11	518454	4293649	324	847	1532
71	41	22	518456	4293650	573	3066	5549
72	104	60	518459	4293641	3105	43179	78155
73	79	49	518460	4293674	2435	22474	40679
74	45	23	518456	4293642	636	3700	6697
75	116	30	518460	4293640	1241	19429	35166
76	45	17	518463	4293638	666	2447	4430
77	20	17	518463	4293636	260	807	1461
78	90	30	518463	4293635	1712	13731	24854
79	88	40	518462	4293634	3091	19735	35720
80	30	16	518466	4293635	323	1294	2342
81	32	18	518463	4293633	437	1660	3005
82	37	30	518462	4293633	806	4072	7370
83	50	30	518458	4293638	914	6146	11125
84	67	45	518453	4293634	1729	15968	28902
85	148	39	518450	4293634	5750	38812	70251
86	73	28	518451	4293633	1757	9384	16985
87	50	27	518451	4293634	880	5321	9632
88	59	16	518452	4293629	605	3263	5905
89	23	15	518463	4293625	285	824	1491
90	27	16	518463	4293627	316	1120	2027
91	60	31	518467	4293626	2154	8248	14930
92	87	32	518466	4293623	2625	14319	25917
93	40	34	518467	4293623	996	5375	9729
94	22	19	518467	4293626	341	1071	1938
95	51	25	518466	4293626	919	4921	8907
96	34	12	518469	4293630	269	1036	1875
97	90	40	518475	4293621	1570	20351	36835
98	15	12	518460	4293625	91	338	612
99	21	10	518458	4293624	158	418	756
100	24	18	518458	4293623	173	1120	2027
101	30	23	518457	4293625	439	2125	3847
102	29	7	518455	4293624	167	399	722
103	18	10	518453	4293622	86	338	612
104	50	27	518452	4293623	573	5321	9632
105	24	16	518452	4293623	216	953	1726
106	32	14	518450	4293618	171	1177	2131
107	54	47	518443	4293619	1007	12617	22837
108	23	14	518452	4293620	204	749	1356
109	30	10	518452	4293613	216	680	1231
110	16	14	518454	4293613	216	456	826
111	29	23	518455	4293614	346	2029	3672
112	9	5	518459	4293614	27	44	80

114	18	11	518459	4293613	130	385	698
115	18	11	518463	4293614	144	385	698
116	25	14	518465	4293617	259	840	1520
117	17	10	518466	4293617	115	313	566
118	13	9	518468	4293607	47	178	322
119	17	12	518467	4293605	95	401	727
120	19	7	518464	4293603	68	224	405
121	29	11	518459	4293606	270	740	1339
122	33	18	518458	4293609	348	1731	3134
123	18	14	518456	4293609	173	536	970
124	15	14	518455	4293609	151	418	756
125	27	27	518458	4293606	258	2291	4147
126	29	9	518456	4293609	205	562	1018
127	36	10	518451	4293607	281	873	1580
128	14	10	518453	4293604	102	240	434
129	28	26	518453	4293604	591	2287	4139
130	120	110	518449	4293601	8091	120303	217749
131	12	11	518447	4293598	89	221	401
132	9	9	518447	4293598	48	105	190
133	9	7	518447	4293598	31	74	135
134	18	11	518450	4293599	147	385	698
135	29	26	518454	4293602	346	2399	4343
136	38	25	518455	4293603	523	3291	5957
137	22	12	518455	4293603	200	571	1034
138	11	5	518457	4293603	31	67	121
139	7	4	518458	4293600	20	24	43
140	10	5	518462	4293598	39	59	106
141	45	16	518462	4293601	382	2253	4077
142	7	6	518462	4293601	39	46	84
143	14	9	518462	4293601	49	208	376
144	34	18	518466	4293601	221	1804	3265
145	66	42	518468	4293599	1756	14235	25765
146	60	32	518470	4293599	1182	8614	15592
147	32	30	518467	4293596	246	3338	6042
148	21	17	518462	4293596	131	863	1562
149	7	6	518462	4293596	23	41	74
150	11	6	518460	4293595	41	76	138
151	36	26	518452	4293596	311	3225	5837
152	18	17	518447	4293599	199	699	1265
153	18	13	518448	4293598	146	484	877
154	8	6	518447	4293596	35	55	100
155	43	27	518453	4293592	665	4330	7837
156	50	38	518455	4293590	1721	8492	15370

157	28	24	518454	4293590	406	2050	3710
158	20	19	518454	4293590	361	940	1701
159	23	22	518454	4293590	407	1391	2517
160	7	4	518454	4293590	24	27	48
161	17	14	518468	4293587	190	496	897
162	12	11	518471	4293583	77	221	401
163	8	5.5	518468	4293582	22	49	89
164	22	13.5	518432	4293555	399	671	1215
165	41	41	518420	4293560	909	7182	13000
166	63	21	518435	4293569	784	5176	9369
167	26	30	518445	4293568	688	2513	4549
168	18	18	518439	4293572	175	756	1368
169	11	6	518437	4293570	41	86	155
170	11	8	518438	4293574	66	127	230
171	8	7	518440	4293577	44	69	124
172	140	90	518445	4293582	7731	112888	204327
173	33	23	518430	4293594	497	2421	4382
174	73	49	518439	4293594	1807	20173	36513
175	27	20	518439	4293602	425	1520	2751
176	37	22	518440	4293598	714	2664	4822
177	186	80	518445	4293594	9097	141721	256514
178	21	16	518445	4293587	220	794	1438
179	20	15	518443	4293592	186	680	1231
180	43	35	518444	4293596	966	6174	11175
181	18	11.5	518445	4293603	123	410	741
182	46	29	518456	4293616	804	5235	9476
183	90	68	518353	4293693	3294	42048	76106
184	30	20	518351	4293692	350	1755	3177
185	89	52	518350	4293696	2174	28693	51934
186	48	30	518350	4293698	1209	5812	10520
187	100	52	518346	4293695	3683	33650	60907
188	39	36	518347	4293696	887	5615	10162
189	96	44	518345	4293701	3081	25323	45835
190	64	35	518367	4293690	1912	10636	19251
191	36	35	518358	4293695	910	4842	8764
192	44	29	518358	4293695	822	4927	8917
193	125	94	518367	4293698	7220	102604	185713
194	100	62	518360	4293701	4560	42801	77470
195	118	53	518354	4293708	3157	43312	78394
196	56	52	518353	4293701	1941	15227	27561
197	54	54	518356	4293699	2435	15255	27612
198	34	13	518352	4293698	325	1156	2092
199	53	48	518352	4293703	1914	12658	22911

200	56	25	518357	4293708	964	5593	10123
201	56	36	518355	4293708	1873	9209	16668
202	21	16	518362	4293706	265	794	1438
203	145	36	518370	4293709	4624	33827	61227
204	82	78	518376	4293709	3754	44662	80839
205	104	86	518375	4293718	5981	70647	127872
206	257	180	518378	4293706	27607	668523	1210027
207	122	106	518380	4293703	9272	116976	211726
208	145	98	518377	4293703	8696	133067	240850
209	130	120	518372	4293702	9528	151181	273638
210	160	97	518383	4293698	8036	150122	271721
211	153	112	518382	4293697	19305	171900	311139
212	192	170	518377	4293699	19624	414940	751042
213	111	83	518400	4293687	5690	73569	133160
214	106	96	518404	4293687	12142	84284	152553
215	84	80	518402	4293689	10227	47785	86491
216	100	70	518409	4293685	2494	50529	91457
217	100	71	518417	4293686	4010	51518	93248
218	90	71	518431	4293688	3407	44605	80735
219	104	102	518432	4293686	6532	89215	161479
220	79	76	518419	4293680	4910	40962	74140
221	131	107	518419	4293680	8580	130601	236388
222	61	60	518418	4293679	4190	20816	37677
223	80	57	518420	4293673	2121	28118	50893
224	86	72	518416	4293675	3229	42726	77334
225	208	95	518344	4293686	10247	208881	378075
226	75	50	518343	4293673	2031	21519	38950
227	41	20	518356	4293679	612	2691	4871
228	95	77	518341	4293685	3515	53664	97131
229	31	17	518338	4293678	343	1470	2661
230	30	16	518340	4293681	242	1294	2342
231	22	15	518346	4293678	412	775	1403
232	12	8	518351	4293677	93	143	259
234	7	5	518368	4293660	19	36	65
235	13	7	518373	4293652	60	133	241
236	10	8	518373	4293652	39	112	202
238	14	8	518383	4293648	84	177	320
239	25	9	518387	4293640	120	459	831
240	20	11	518409	4293639	135	445	806
241	53	12	518414	4293636	223	1901	3441
242	27	8	518409	4293644	152	434	786
243	8	7	518427	4293652	39	63	114
244	27	16	518431	4293638	272	1120	2027

245	275	109	518444	4293628	18054	369315	668460
246	52	24	518446	4293627	1067	4779	8651
247	18	15	518444	4293622	262	589	1066
248	51	27	518444	4293626	848	5467	9896
249	17	16	518445	4293623	151	595	1077
250	24	12	518449	4293626	233	643	1164
251	97	97	518449	4293627	5809	75718	137050
252	52	28	518544	4293691	935	5901	10681
253	21	15	518542	4293682	209	727	1316
254	41	19	518543	4293683	507	2509	4541
255	37	14	518526	4293681	340	1436	2599
256	41	14	518522	4293675	376	1652	2991
257	44	20	518512	4293679	571	2964	5365
258	50	22	518512	4293676	711	4022	7279
259	34	12	518504	4293678	269	1036	1875
260	32	17	518498	4293679	357	1535	2779
261	20	11	518511	4293672	147	445	806
262	22	12	518512	4293673	176	571	1034
263	12	9	518527	4293667	73	168	304
264	28	16	518528	4293673	295	1177	2131
265	70	25	518563	4293683	1120	7589	13735
266	36	24	518559	4293687	561	2890	5232
267	47	36	518564	4293692	1083	7247	13117
268	25	14	518565	4293699	232	840	1520
269	41	29	518564	4293700	767	4473	8096
270	71	53	518570	4293699	2369	21621	39135
271	58	29	518570	4293696	1077	7188	13011
272	25	25	518571	4293694	409	1856	3360
273	53	21	518572	4293693	719	4087	7397
274	49	33	518573	4293694	1036	6811	12328
275	90	30	518574	4293698	1712	13731	24854
276	60	32	518569	4293706	1226	8614	15592
277	20	15	518575	4293712	199	680	1231
278	100	54	518588	4293724	3373	35433	64133
279	23	20	518595	4293722	303	1221	2209
280	33	27	518584	4293701	578	3015	5456
281	35	16	518583	4293701	367	1597	2891
282	48	24	518579	4293701	744	4284	7754
283	102	37	518580	4293701	2376	21708	39291
284	35	32	518577	4293695	724	4122	7461
285	28	16	518577	4293693	295	1177	2131
286	10	9	518575	4293698	61	131	237
287	42	23	518567	4293675	626	3367	6094

288	20	14	518550	4293668	186	619	1120
289	44	23	518537	4293664	655	3588	6494
290	14	14	518523	4293663	131	380	688
291	27	19	518523	4293663	337	1417	2565
292	32	30	518502	4293662	622	3338	6042
293	33	19	518503	4293661	410	1864	3374
294	9	6	518518	4293654	37	65	118
295	23	11	518518	4293654	169	539	975
296	89	50	518523	4293652	2791	27194	49222
297	40	20	518525	4293650	521	2602	4709
298	91	64	518532	4293647	3632	39291	71117
299	32	30	518532	4293641	622	3338	6042
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301	30	26	518529	4293648	508	2513	4549
302	53	53	518529	4293648	1779	14495	26236
303	43	20	518530	4293648	559	2872	5199
304	38	21	518535	4293651	519	2593	4693
305	23	22	518536	4293653	332	1391	2517
306	85	41	518538	4293652	2198	19467	35235
307	81	60	518577	4293664	3043	30678	55527
308	82	49	518577	4293666	2526	23650	42806
309	79	25	518575	4293670	1261	8954	16206
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312	31	17	518556	4293650	346	1470	2661
313	21	15	518556	4293650	209	727	1316
314	26	13	518557	4293649	224	801	1449
315	24	14	518556	4293650	223	794	1438
316	31	18	518556	4293654	366	1590	2877
317	39	22	518554	4293643	557	2863	5182
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319	37	22	518554	4293640	529	2664	4822
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322	23	21	518537	4293638	318	1305	2362
323	25	11	518534	4293638	183	604	1093
324	21	20	518532	4293639	277	1078	1951
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326	60	26	518530	4293640	1001	6485	11738
327	18	11	518489	4293642	133	385	698
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329	24	16	518490	4293636	254	953	1726
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333	36	20	518510	4293631	470	2253	4077
334	27	19	518511	4293630	337	1417	2565
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337	23	10	518513	4293626	154	473	856
338	31	17	518514	4293628	346	1470	2661
339	38	25	518515	4293623	616	3291	5957
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342	29	26	518520	4293619	491	2399	4343
343	43	17	518522	4293619	477	2300	4162
344	17	10	518542	4293616	114	313	566
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368	40	10	518508	4293601	264	1008	1825
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377	53	20	518528	4293599	686	3823	6919
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379	131	62	518536	4293594	5030	61921	112077
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383	28	17	518440	4293583	313	1279	2315
384	57	32	518432	4293593	1166	8031	14536
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388	14	11	518417	4293601	104	273	495
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392	33	19	518402	4293628	410	1864	3374
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395	26	14	518414	4293618	241	886	1604
396	33	32	518413	4293613	683	3803	6884
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413	32	25	518416	4293616	521	2602	4709
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423	24	17	518446	4293616	269	1036	1875
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432	62	31	518425	4293646	1227	8627	15614
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436	39	30	518431	4293630	755	4376	7920
437	19	18	518434	4293632	227	814	1473
438	65	26	518438	4293636	1082	7235	13095
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440	90	48	518444	4293639	2712	26114	47266
441	12	11	518441	4293641	89	221	401
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443	28	9	518447	4293636	168	536	970
444	67	43	518446	4293638	1824	15006	27160
445	23	12	518450	4293638	184	607	1099
446	53	21	518451	4293689	719	4087	7397
447	18	11	518451	4293643	133	385	698
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453	47	20	518454	4293651	610	3244	5871
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455	49	43	518487	4293674	1343	9782	17705
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457	39	30	518516	4293652	755	4376	7920
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466	31	35	518481	4293637	701	3947	7144
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474	17	12	518481	4293631	137	401	727
475	13	9	518481	4293631	79	188	340
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478	12	11	518489	4293631	89	221	401
479	8	7	518479	4293630	39	69	124
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487	21	17	518467	4293608	236	863	1562
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516	21	16	518507	4293585	223	794	1438
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526	103	54	518517	4293594	3472	36894	66779
527	60	34	518525	4293589	1301	9359	16940
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543	78	38	518588	4293688	1875	15600	28236
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638	50	40	518451	4293513	1276	9109	16487
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644	36	23	518349	4293588	538	2727	4936
645	29	12	518353	4293588	230	833	1508
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673	34	16	518326	4293630	357	1535	2779
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685	37	16	518300	4293601	388	1723	3120
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687	22	22	518289	4293611	318	1309	2368
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695	39	20	518272	4293650	508	2513	4549
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708	27	18	518278	4293663	320	1316	2382
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748	90	48	518150	4293666	2712	26114	47266
749	41	17	518141	4293665	455	2155	3900
750	49	35	518139	4293665	1098	7382	13361
751	44	21	518113	4293667	599	3168	5735
752	68	64	518061	4293671	2731	26379	47745
753	53	27	518061	4293671	920	5763	10431
754	29	19	518061	4293671	361	1562	2828
755	78	52	518054	4293685	2549	23956	43361
756	39	18	518056	4293709	458	2176	3938
757	70	52	518000	4293704	2293	20661	37396
758	88	24	518023	4293637	1346	9814	17763
759	31	23	518067	4293630	465	2223	4023
760	31	18	518067	4293630	366	1590	2877
761	41	28	518067	4293630	741	4263	7717

762	28	19	518067	4293630	349	1489	2695
763	27	20	518067	4293630	354	1520	2751
764	17	12	518067	4293630	137	401	727
765	40	30	518083	4293600	774	4530	8199
766	10	7	518091	4293600	48	93	168
767	27	9	518096	4293600	162	510	923
768	14	8	518096	4293600	76	177	320
769	19	13	518124	4293587	165	521	944
770	41	30	518205	4293578	793	4685	8480
771	57	40	518249	4293610	1451	10897	19723
772	46	35	518252	4293615	1032	6771	12255
773	46	23	518263	4293614	684	3813	6902
774	85	60	518281	4293603	3190	32768	59311
775	63	37	518225	4293555	1482	11231	20329
776	100	63	518232	4293554	3923	43748	79184
777	65	42	518232	4293552	1730	13940	25232
778	51	32	518236	4293552	1046	6898	12485
779	57	33	518240	4293550	1202	8376	15161
780	82	29	518240	4293550	1512	11542	20891
551	129	35	518596	4293743	2831	27739	50208
552	116	90	518599	4293742	6431	87288	157992
553	34	21	518605	4293739	466	2227	4031
554	22	17	518603	4293726	247	920	1665
555	45	21	518608	4293717	613	3267	5914
556	42	32	518606	4293724	865	5289	9573
557	31	21	518607	4293724	425	1963	3552
558	23	15	518608	4293722	229	824	1491
559	60	29	518607	4293719	1114	7529	13628
560	43	16	518608	4293710	449	2117	3831
561	26	16	518604	4293711	274	1064	1925
562	36	27	518603	4293712	630	3396	6146
563	29	21	518604	4293705	399	1792	3243
564	56	27	518632	4293736	971	6213	11246
565	87	49	518624	4293727	2677	25644	46415
566	101	55	518602	4293770	3468	36831	66664
567	67	25	518601	4293780	1073	7147	12937
568	54	44	518599	4293777	1510	11529	20867
569	113	78	518610	4293777	5449	69247	125337
570	60	34	518618	4293793	1301	9359	16940
571	55	50	518643	4293787	1743	14080	25485
572	36	25	518632	4293740	584	3056	5532
573	50	39	518627	4293755	1245	8799	15926
574	60	52	518624	4293761	1972	16734	30288

575	51	40	518608	4293753	1301	9359	16940
576	67	43	518618	4293741	1824	15006	27160
577	110	75	518617	4293736	5108	63259	114499
578	38	31	518607	4293727	760	4417	7994
579	35	18	518600	4293728	412	1877	3397
580	16	16	518601	4293727	171	548	991
581	22	18	518598	4293728	262	994	1800
582	37	17	518597	4293701	411	1872	3389
583	28	21	518595	4293695	385	1708	3091
584	16	16	518599	4293697	171	548	991
585	53	26	518598	4293694	886	5473	9906
586	36	31	518608	4293694	721	4102	7424
587	69	32	518606	4293684	1406	10429	18876
588	74	70	518602	4293681	3239	33473	60587
589	54	38	518611	4293674	1309	9434	17076
590	50	27	518610	4293669	869	5321	9632
591	25	14	518611	4293666	232	840	1520
592	90	65	518607	4293646	3648	39532	71552
593	35	17	518598	4293626	390	1735	3141
594	24	16	518598	4293626	254	953	1726
595	17	15	518586	4293621	170	545	986
597	38	35	518695	4293579	856	5214	9437
598	39	30	518695	4293579	755	4376	7920
599	33	22	518695	4293579	473	2278	4124
600	51	30	518617	4293581	982	6315	11430
601	26	15	518626	4293567	258	974	1763
602	45	28	518635	4293590	812	4842	8764
603	39	25	518635	4293590	632	3410	6172
604	25	15	518635	4293590	248	923	1671
605	33	25	518641	4293585	536	2713	4911
606	87	25	518643	4293590	1385	10216	18491
607	46	27	518646	4293598	801	4748	8594
608	40	21	518645	4293610	546	2781	5034
609	160	67	518652	4293646	6600	90506	163815
610	37	21	518652	4293645	506	2500	4525
611	160	70	518657	4293646	6889	96093	173928
612	45	33	518658	4293648	954	6062	10973
613	144	73	518660	4293645	6474	88113	159484
614	85	53	518659	4293646	2825	27655	50056
615	88	80	518658	4293651	4373	50924	92172
616	57	31	518655	4293652	1130	7690	13918
617	81	60	518652	4293651	3043	30678	55527
618	74	18	518642	4293649	857	5225	9457

619	51	32	518630	4293630	1046	6898	12485
620	26	16	518628	4293630	274	1064	1925
621	75	40	518626	4293630	1898	15860	28706
622	48	20	518613	4293623	622	3338	6042
623	70	44	518618	4293658	1947	16441	29758
624	25	12	518617	4293662	199	680	1231
625	45	33	518619	4293667	954	6062	10973
626	60	29	518622	4293672	1114	7529	13628
627	28	21	518626	4293673	385	1708	3091
628	32	23	518624	4293692	480	2321	4201
629	34	28	518623	4293694	617	3300	5974
630	26	15	518637	4293711	258	974	1763
631	30	19	518630	4293711	374	1636	2962
632	27	25	518624	4293702	441	2062	3733
633	55	55	518618	4293699	1913	16041	29034
634	41	38	518630	4293716	999	6473	11717
635	25	15	518630	4293716	248	923	1671
636	35	19	518632	4293721	434	2021	3657
637	119	66	518608	4293546	4867	59144	107050

Bomb Field Data Summary Statistics

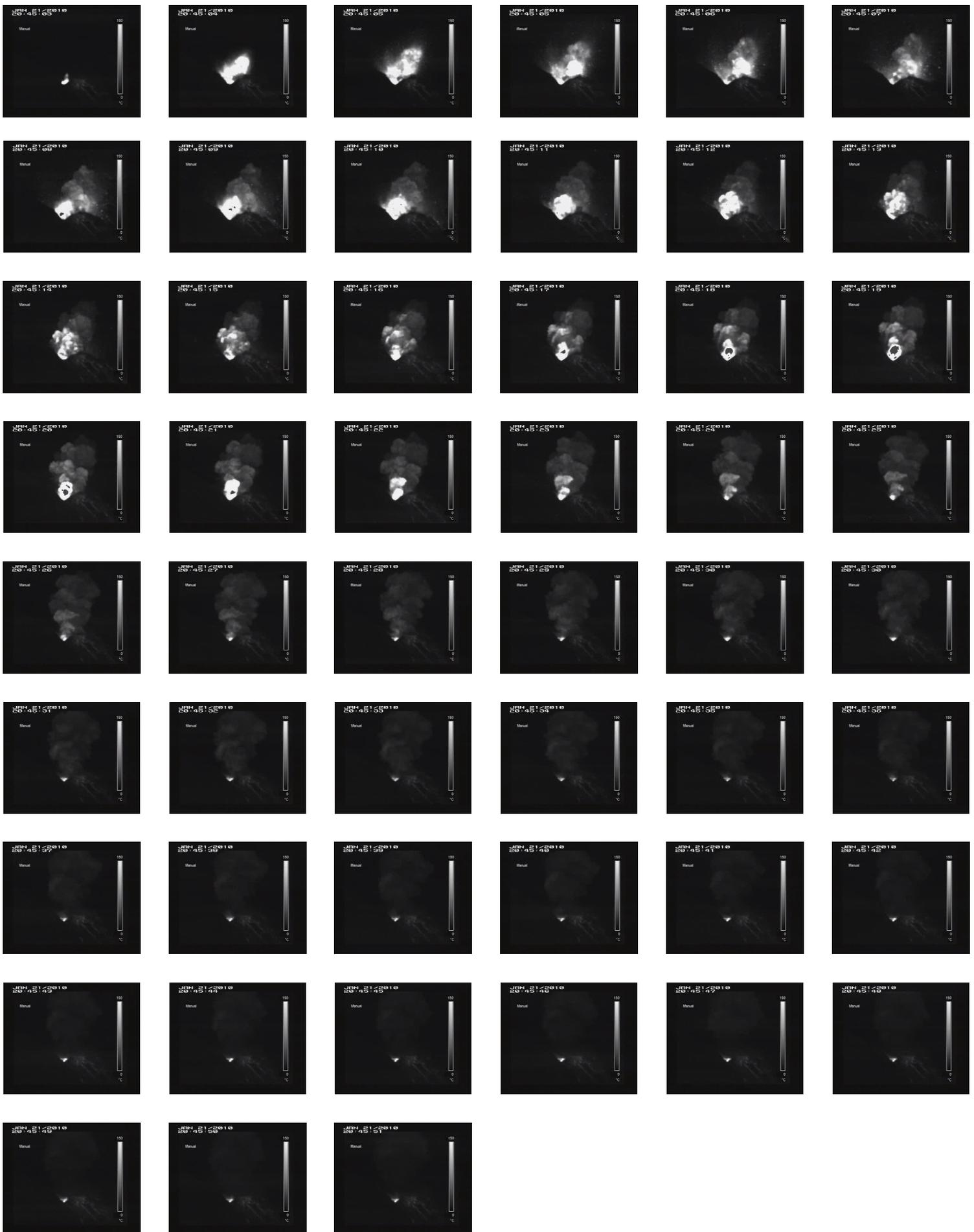
(1) Summary statistics for 690 bombs from the 21 January 2010 explosion (yellow points, Figure 1)

Statistic	Long Axis (cm)	Short Axis (cm)	Area (cm ²)	Volume (cm ³)	Weight (g)
min	7	4	19	24	43
max	459	180	38081	1047902	1896703
mean	48	29	1320	14849	26876
St. Dev	38	22	2648	56547	102351
SUM			9.1E+05	1.0E+07	1.9E+07

(2) Summary statistics for 86 bombs from the 24 November 2009 explosion (purple points, Figure 2)

Statistic	Long Axis (cm)	Short Axis (cm)	Area (cm ²)	Volume (cm ³)	Weight (g)
min	16	12	170	545	986
max	160	90	6889	96093	173928
mean	54	33	1417	13653	24713
St. Dev	32	18	1632	22194	40170
SUM			1.E+05	1.E+06	2.E+06

Item DR3



1 Hz video stills from FLIR systems A20 camera located at ROC

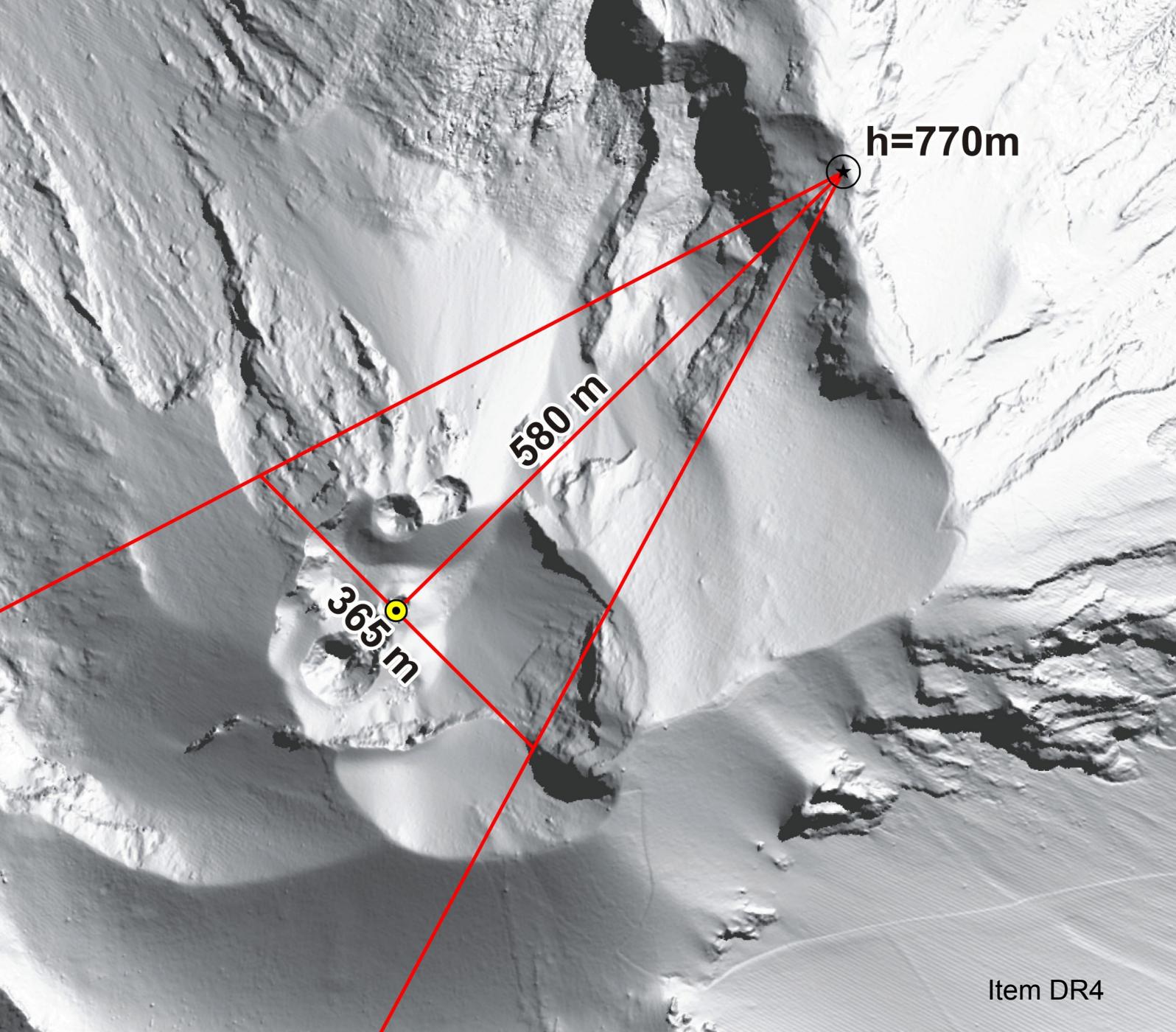
Camera location: 33 S 518772 4294306, elevation 770 m

Field of view: 35° x 25°

Image dimension: 328 x 270 pixels (365 x 257 m at location of Central Crater - 580 m from the camera)

For image geometry, see supporting material 3.

Explosion duration: 51 sec



h=770m

580 m

365 m