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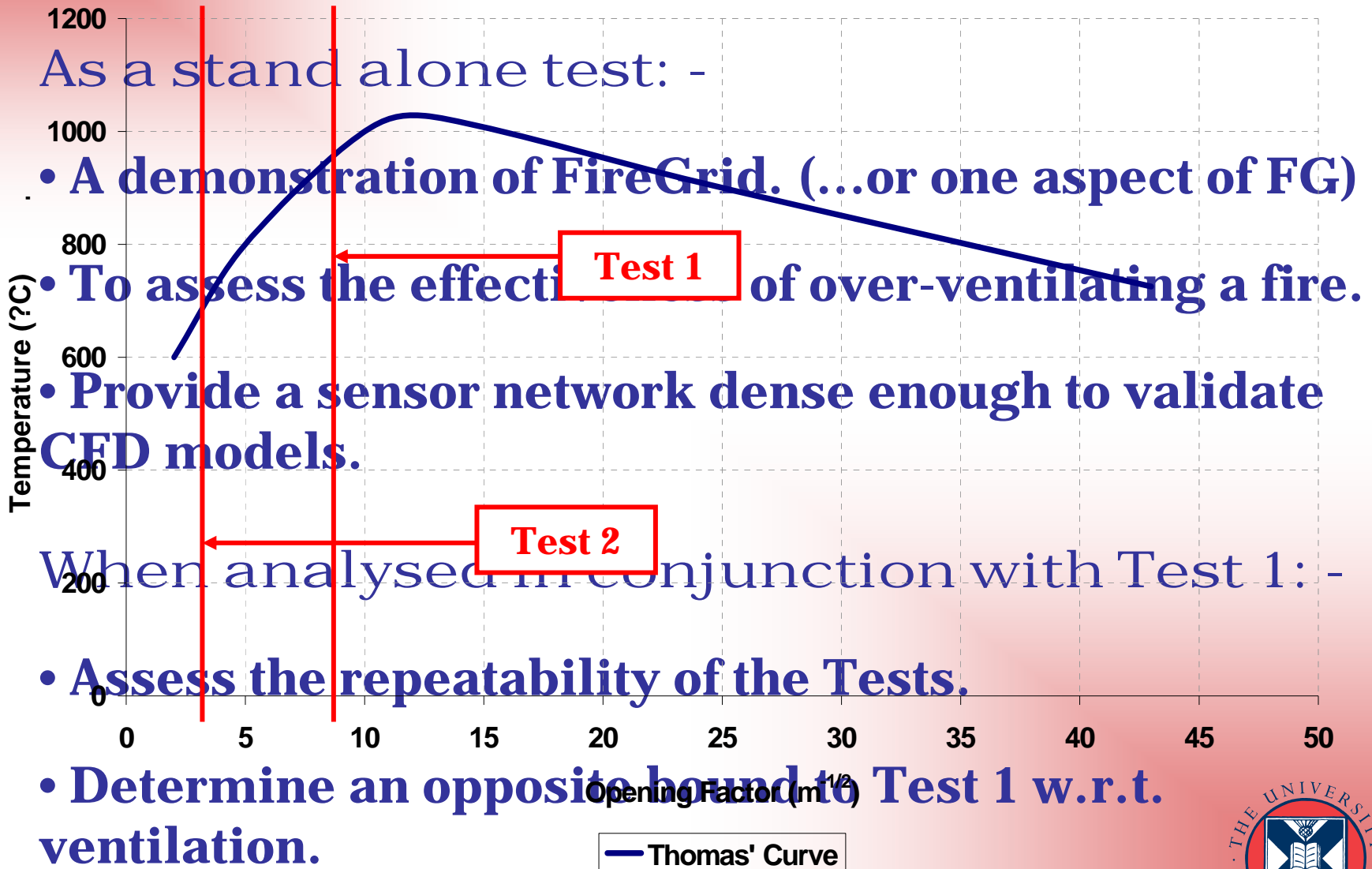
Test Two:

# The 'Controlled' Compartment Fire

Adam Cowlard, Cecília Abecassis Empis,  
Thomas Steinhaus, José L. Torero



# OBJECTIVES OF TEST 2

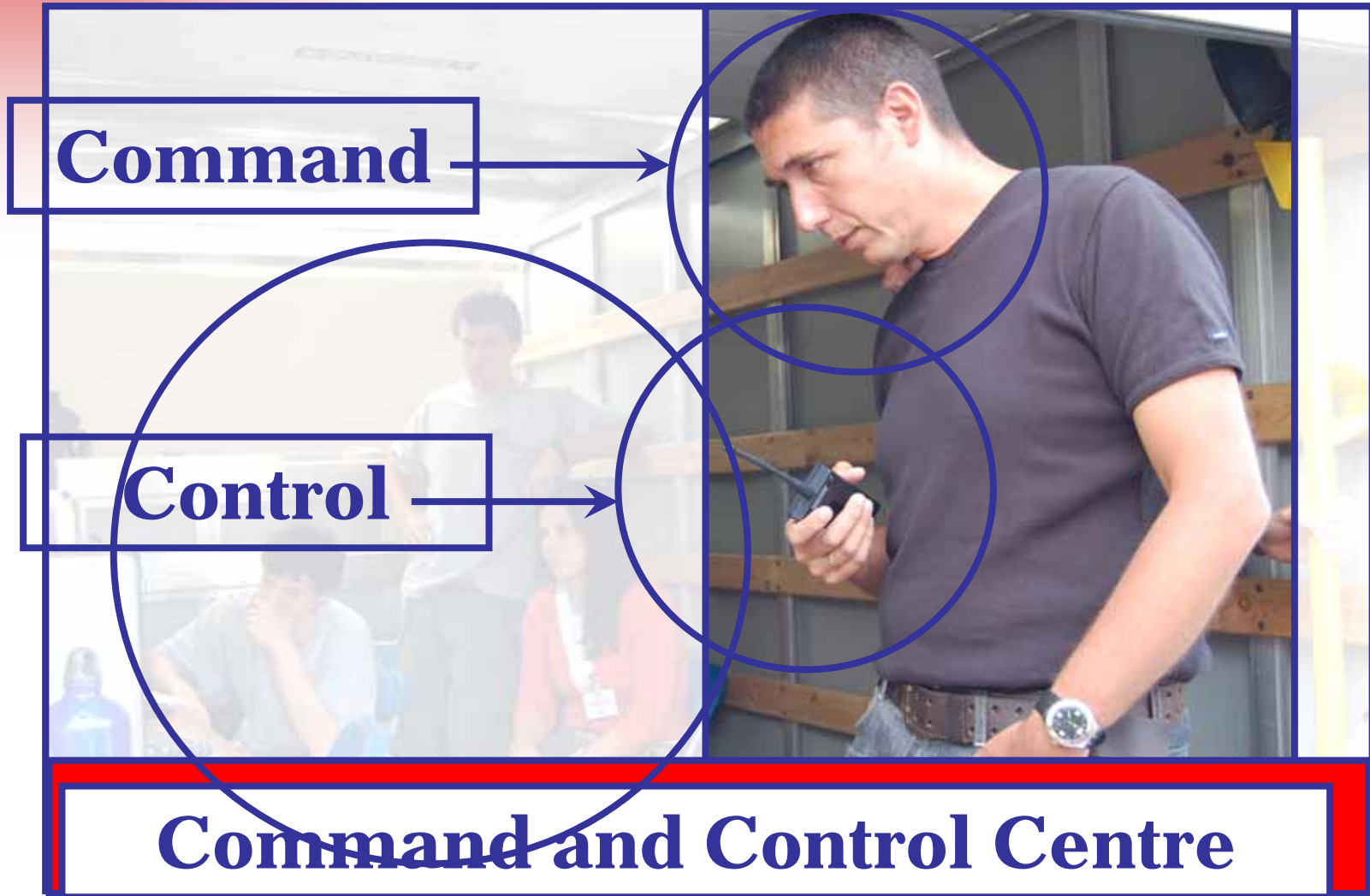


889	121.361	108.912	107.523	100.577	85.874	53.773	40.355	37.813	36.034	119.198	116.782	116.273	118.308
207	125.442	112.839	111.949	101.714	84.747	52.891	42.134	39.974	37.94	125.57	124.417	122.124	125.314
207	125.442	112.839	111.949	101.714	84.747	52.891	42.134	39.974	37.94	125.57	124.417	122.124	125.314
356	131.72	117.799	117.163	108.281	82.868	53.143	42.389	40.101	38.322	132.232	131.976	128.773	132.488
355	138.842	122.821	120.023	107.079	84.431	55.219	44.484	42.45	41.433	136.394	135.753	132.806	136.778
343	141.551	127.425	124.223	112.773	87.316	58.115	46.898	44.356	41.815	138.842	137.81	134.728	138.71
343	141.551	127.425	124.223	112.773	87.316	58.115	46.898	44.356	41.815	138.842	137.81	134.728	138.713
95	142.969	130.372	126.657	116.97	93.719	60.256	48.67	45.5	41.56	138.068	138.068	135.369	138.842
345	147.742	134.216	129.219	120.404	96.231	63.64	48.922	44.738	42.831	139.358	138.584	138.455	142.324
345	147.742	134.216	129.219	120.404	96.231	63.64	48.922	44.738	42.831	139.358	138.584	138.455	142.324
18	152.918	138.713	136.009	124.351	97.486	66.021	49.678	46.517	43.594	144.646	143.614	143.098	148
18	152.918	138.713	136.009	124.351	97.486	66.021	49.678	46.517	43.594	144.646	143.614	143.098	148
885	155.901	141.68	137.681	127.297	103.795	70.281	50.685	47.407	45.755	145.936	145.42	146.323	151.881
36	156.808	144.001	139.616	133.063	108.342	71.033	52.448	48.544	46.644	148.903	148.903	149.548	155.771
36	156.808	144.001	139.616	133.063	108.342	71.033	52.448	48.544	46.644	148.903	148.903	149.548	155.771
25	156.227	144.971	138.264	129.029	108.533	72.977	53.647	50.876	46.71	150.521	150.392	151.17	156.357
92	157.005	146.132	141.746	135.307	114.238	78.862	55.661	51.254	46.71	152.466	151.559	152.596	158.043
42	159.339	148.195	144.197	139.812	120.089	87.506	59.314	51.002	46.202	153.374	152.466	154.412	160.896
42	159.339	148.195	144.197	139.812	120.089	87.506	59.314	51.002	46.202	153.374	152.466	154.412	160.896
91	163.684	149.806	144.517	136.522	118.37	91.71	63.891	51.315	45.882	161.607	159.791	160.31	166.678
13	171.623	154.604	150.065	141.809	126.016	100.007	66.647	51.189	46.009	166.678	165.116	166.808	171.493
13	171.623	154.604	150.065	141.809	126.016	100.007	66.647	51.189	46.009	166.678	165.116	166.808	171.493
1	193.642	171.753	168.63	153.826	131.653	105.563	71.158	51.189	45.882	189.343	187.518	186.084	192.079
1	193.642	171.753	168.63	153.826	131.653	105.563	71.158	51.189	45.882	189.343	187.518	186.084	192.079
73	207.18	183.868	179.567	170.321	139.1	114.681	72.286	52.826	46.517	203.93	201.459	198.072	203.15
995	217.183	193.903	190.515	185.041	147.484	121.803	75.416	54.841	47.407	213.81	208.61	206.92	214.2
111	226.12	204.45	203.28	194.554	159.661	132.678	82.178	55.722	48.166	228.579	222.882	218.867	224.954
111	226.12	204.45	203.28	194.554	159.661	132.678	82.178	55.722	48.166	228.579	222.882	218.867	224.954
337	246.664	214.917	212.187	195.403	164.142	140.843	85.373	57.299	48.987	245.638	238.83	234.962	242.433
42	269.264	232.513	225.151	209.458	181.068	151.948	88.636	59.565	49.869	267.615	259.457	256.651	263.027
42	269.264	232.513	225.151	209.458	181.068	151.948	88.636	59.565	49.869	267.615	259.457	256.651	263.027
376	295.428	251.023	240.635	221.654	196.706	165.704	94.789	61.826	50.498	277.381	268.629	266.215	273.322
376	295.428	251.023	240.635	221.654	196.706	165.704	94.789	61.826	50.498	277.381	268.629	266.215	273.322

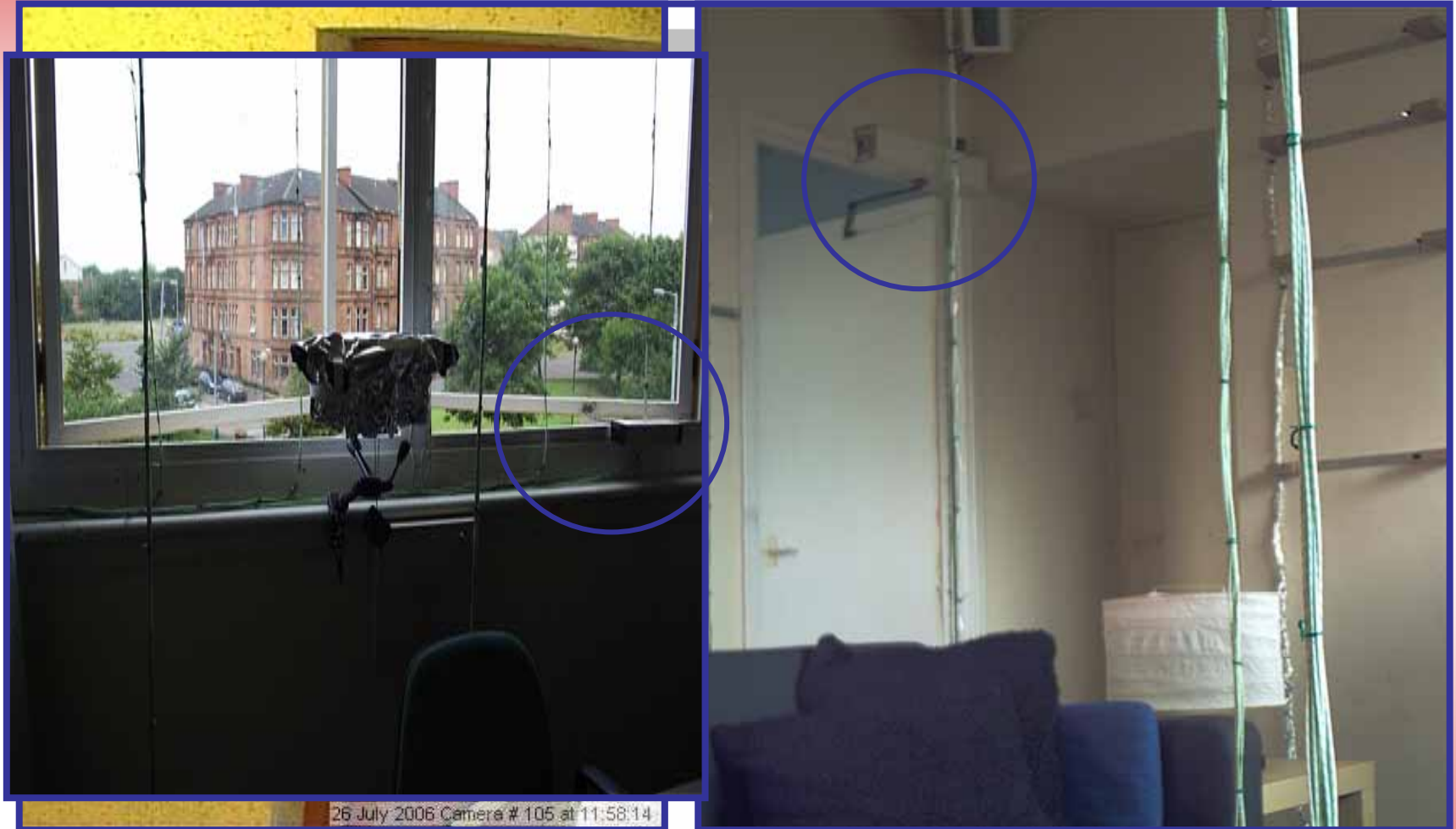
# FireGrid In Dalmarnock Test 2



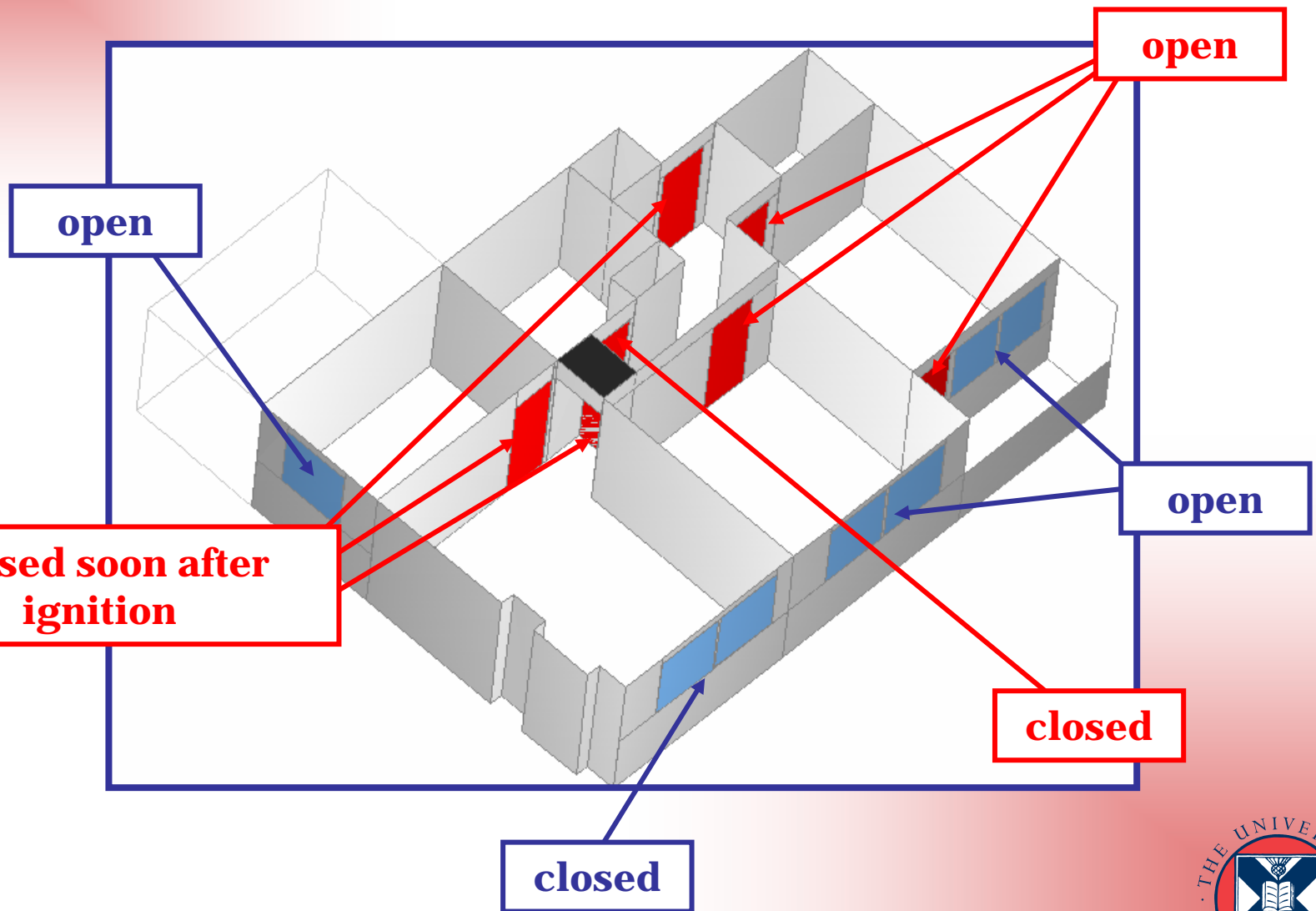
# FireGrid In Dalmarnock Test 2



# FireGrid In Dalmarnock Test 2



# INITIAL VENTILATION CONDITIONS



# IGNITION



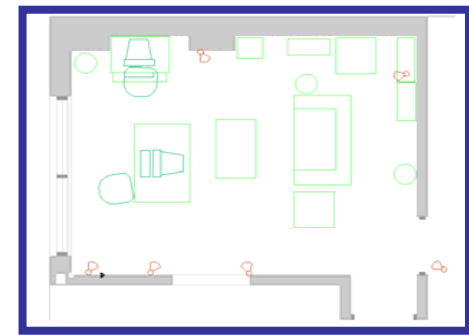


# IGNITION



**300ml of heptane**

# AS IT HAPPENED

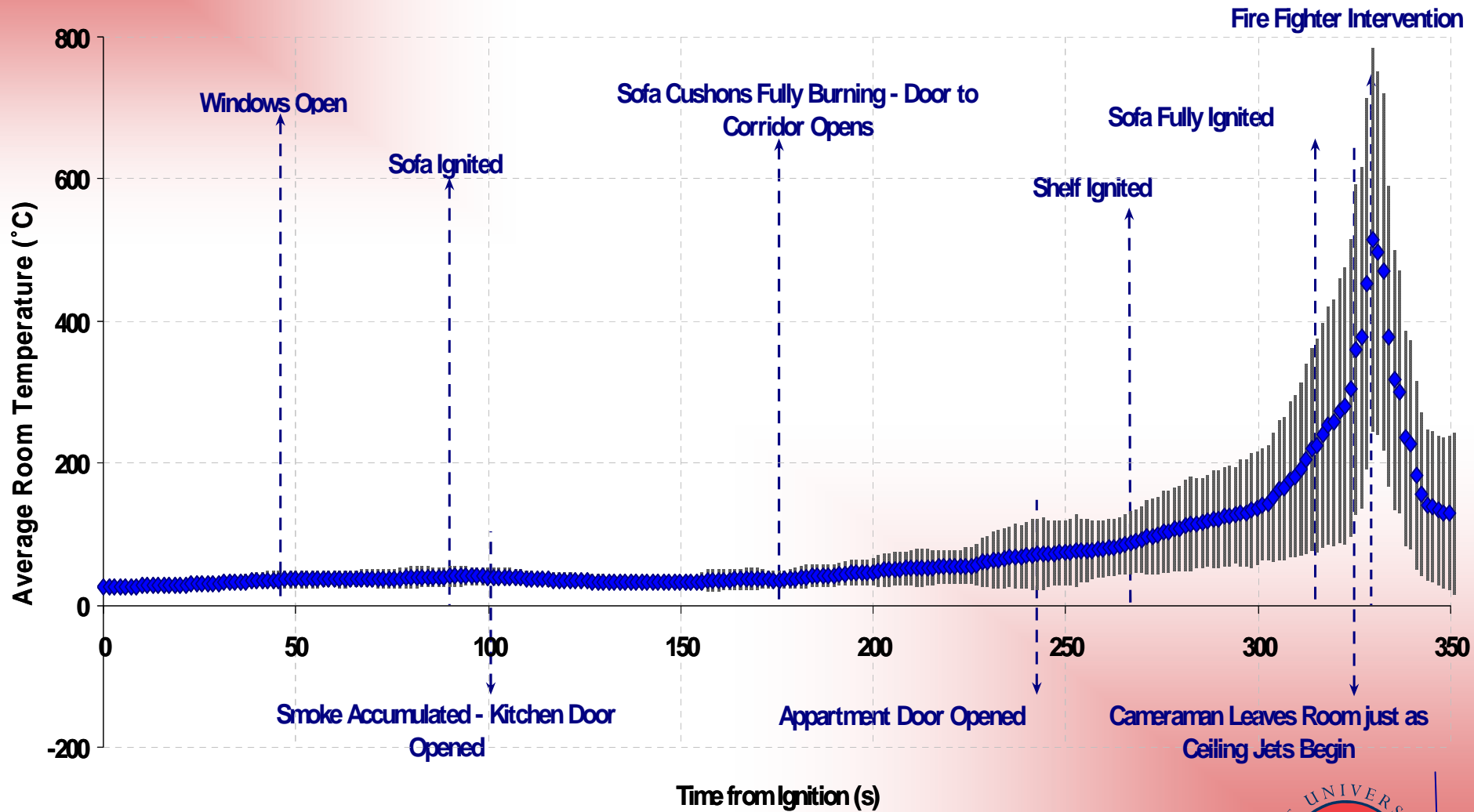


## Time Line

- **t = 0 ignition**
- **t = 24 Pedro leaves**
- **t = 26 compartment doors close**
- **t = 30 windows opening**
- **t = 104 kitchen door opens**
- **t = 180 corridor door opens**
- **t = 243 front door opens**
- **t = 268 fire spreads to bookshelf**
- **t = 324 large fire growth, cameraman exit**
- **t = 332 fire extinguished**



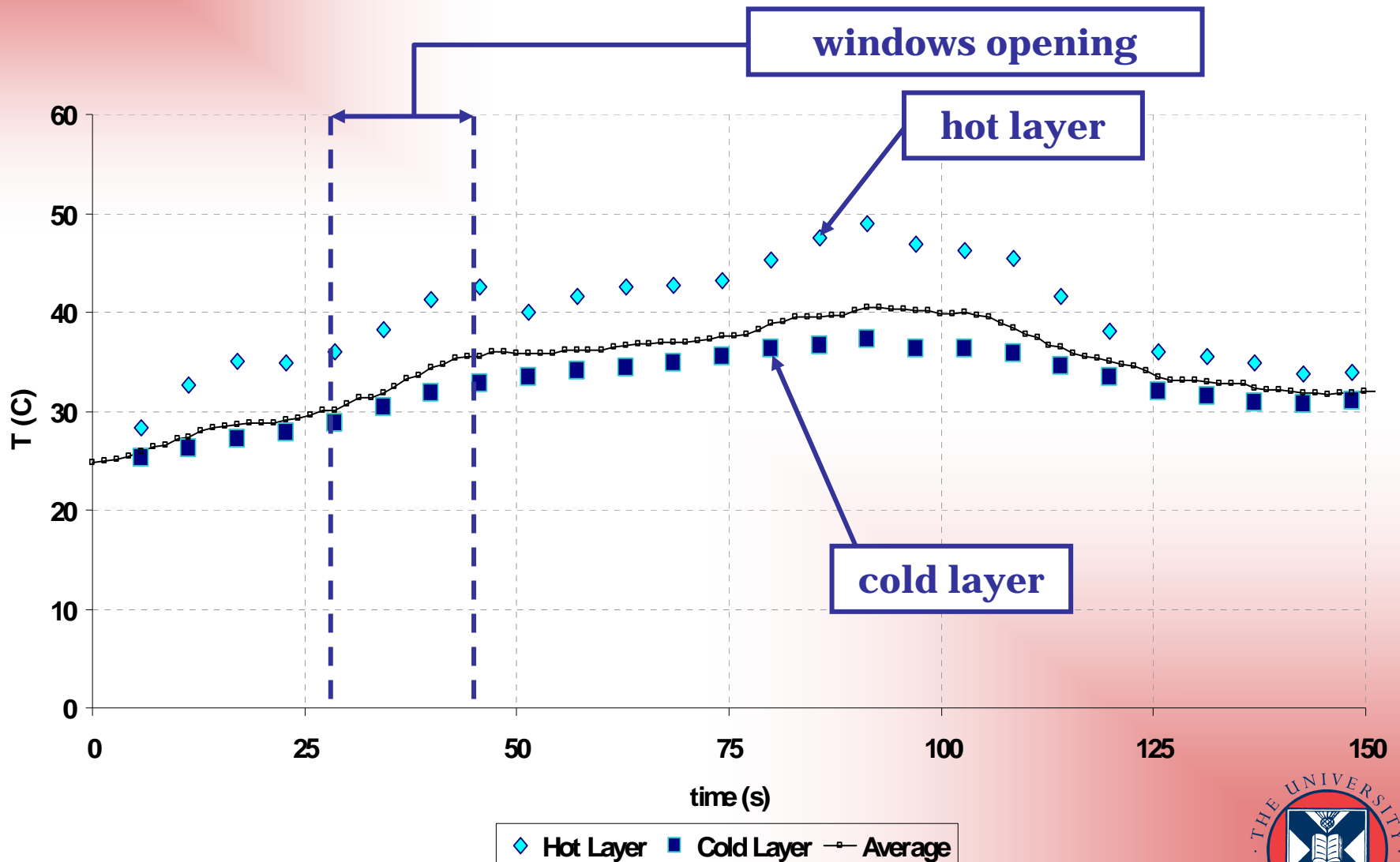
# AVERAGE TEMPERATURE vs. TIME



# WINDOWS OPENING



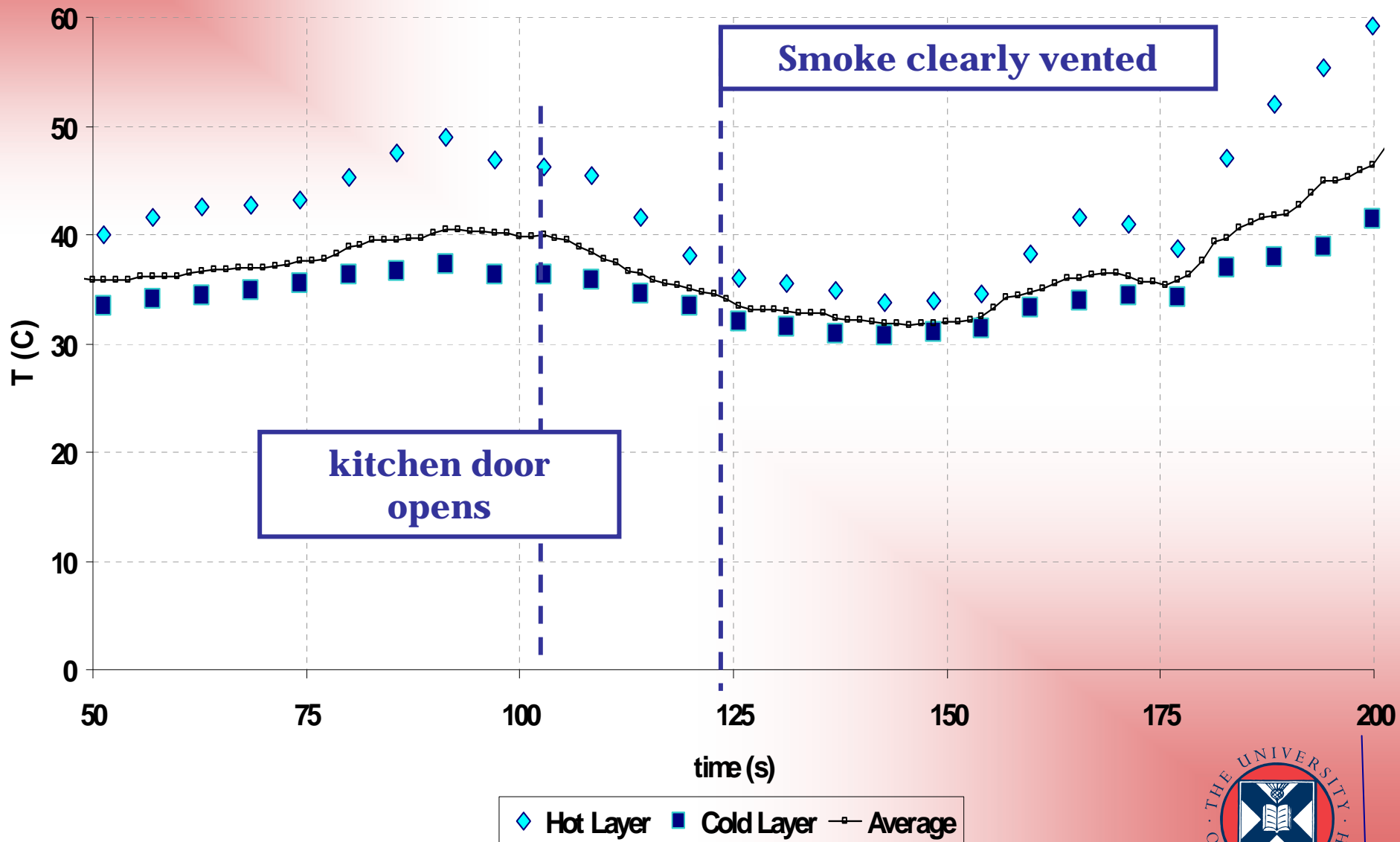
# WINDOWS OPENING



# KITCHEN DOOR OPENING



# KITCHEN DOOR OPENING



# KITCHEN DOOR OPENING





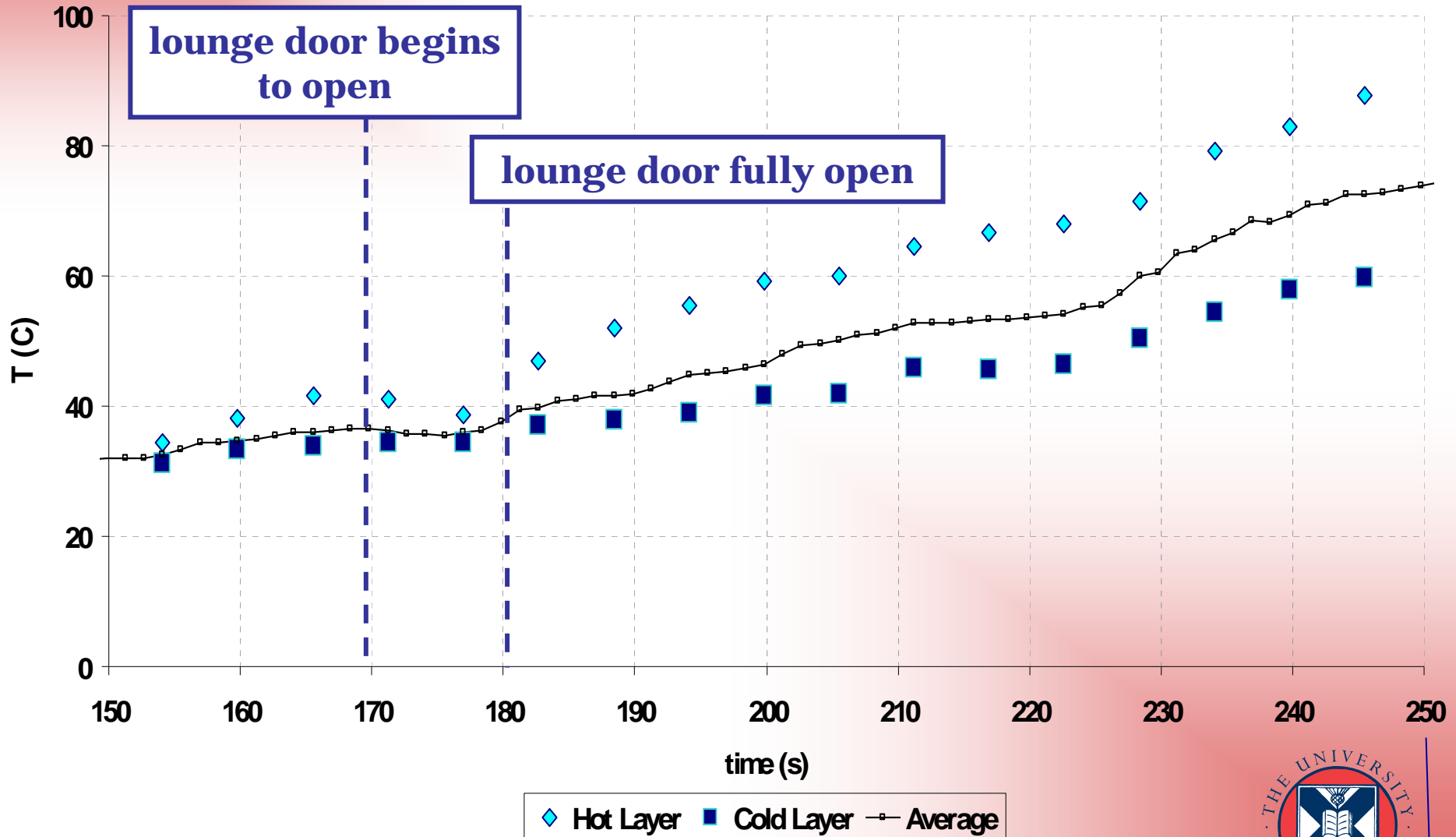
# LOUNGE DOOR OPENS



26 July 2006 Camera # 113 at 11:57:10



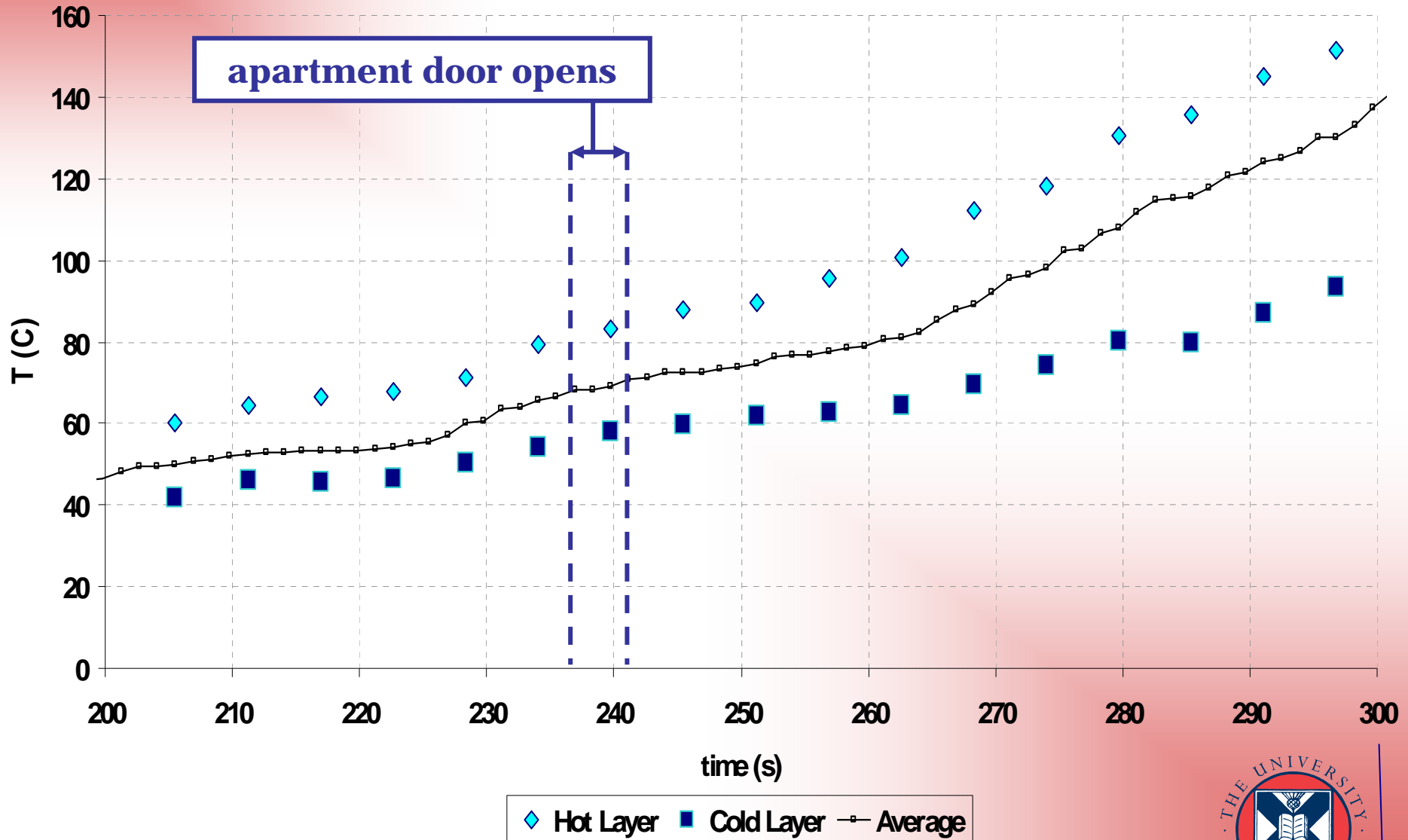
# LOUNGE DOOR OPENS



# APARTMENT DOOR OPENS



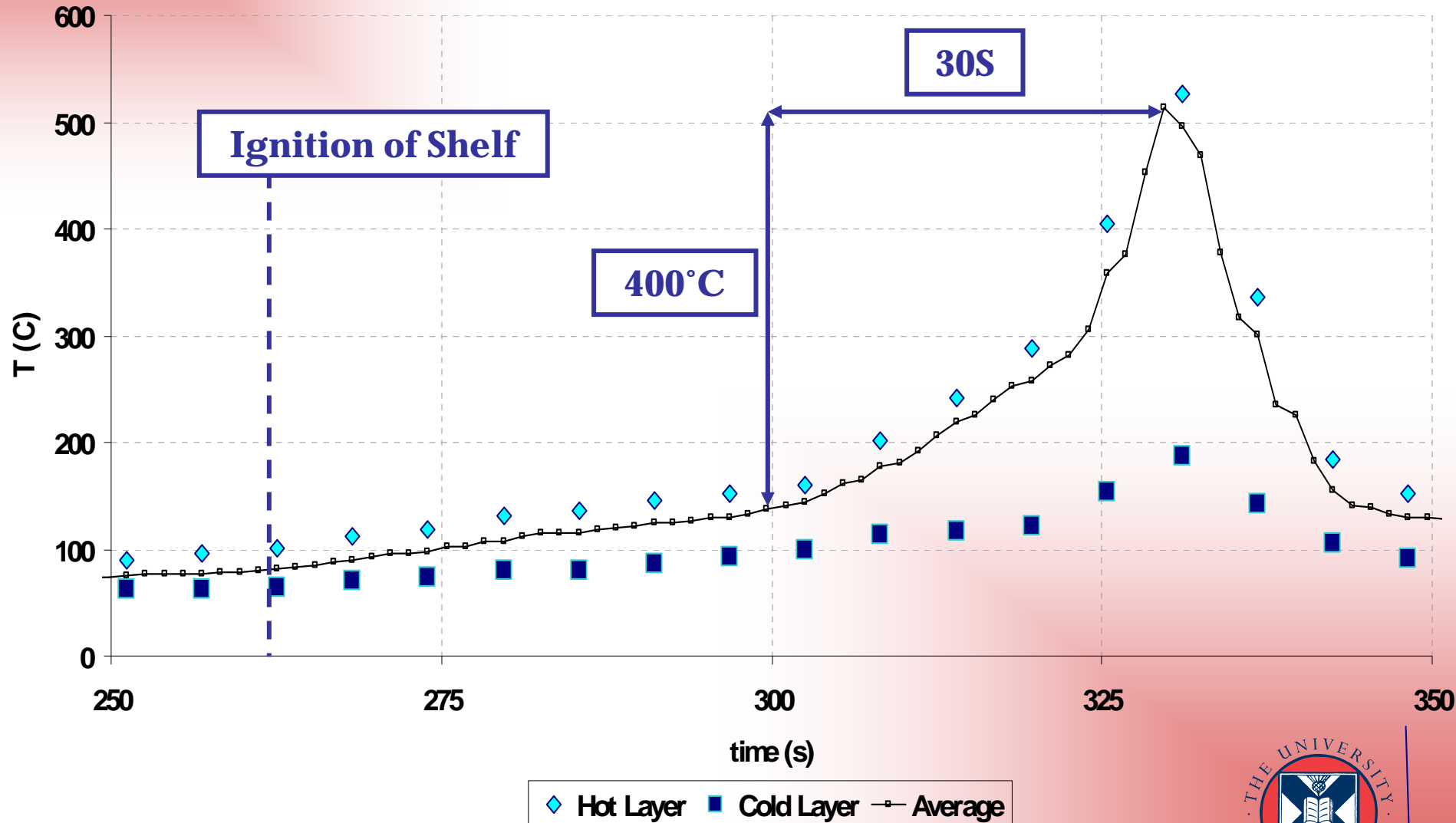
# APARTMENT DOOR OPENS



# THE EXCITING END



# THE EXCITING END



# WAS THE OVER VENTILATION A SUCCESS?



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## WAS THE OVER VENTILATION A SUCCESS?

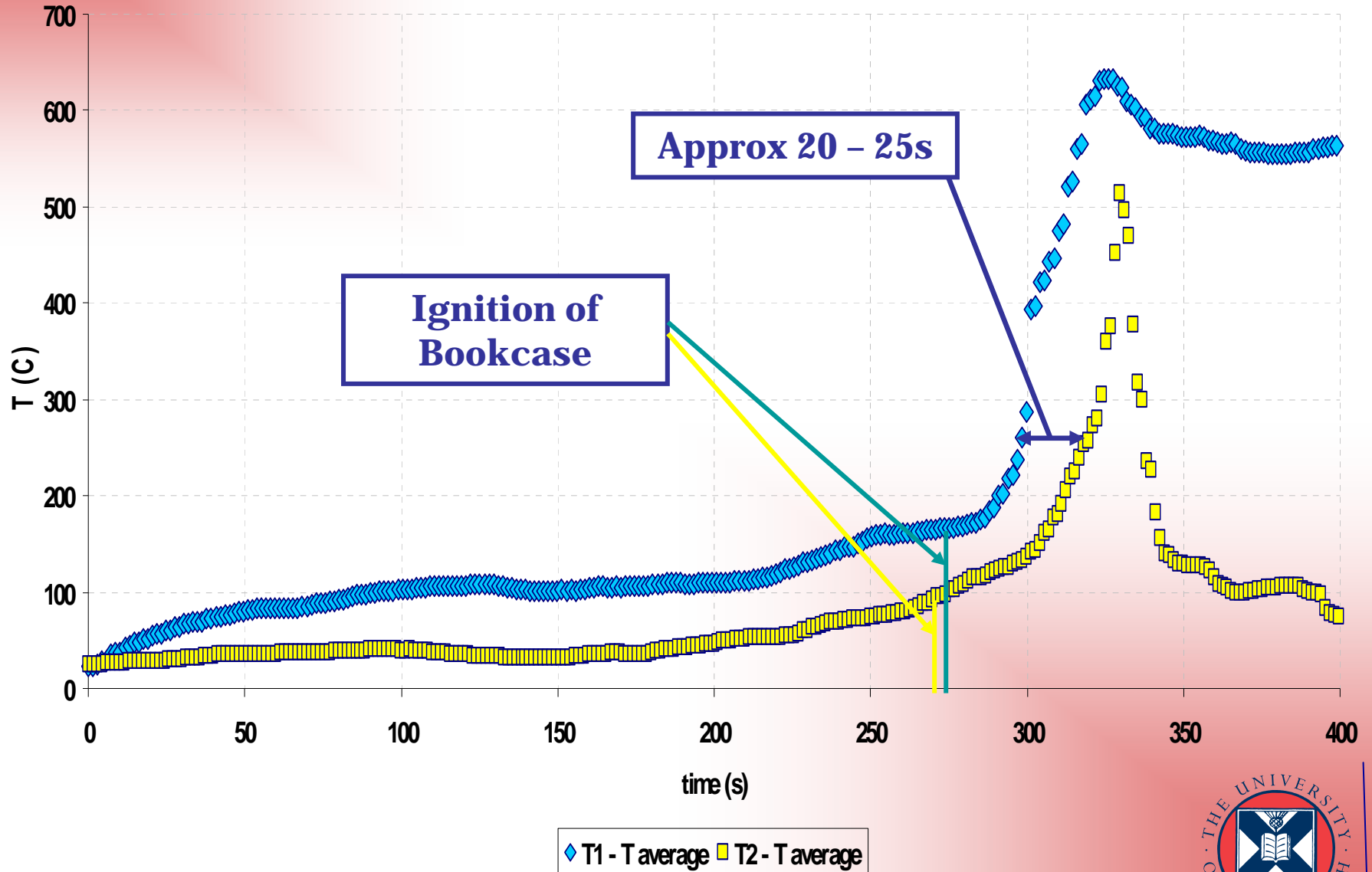
- **Initially it made a positive difference, later on it was not as effective.**
- **Given a more advanced system, where a prediction is made to assess the impact of any changes, it appears this technique could be beneficial.**
- **Average compartment temperature didn't surpass 50°C for 210 s (3.5 mins).**

HOW DOES THIS COMPARE TO TEST 1?

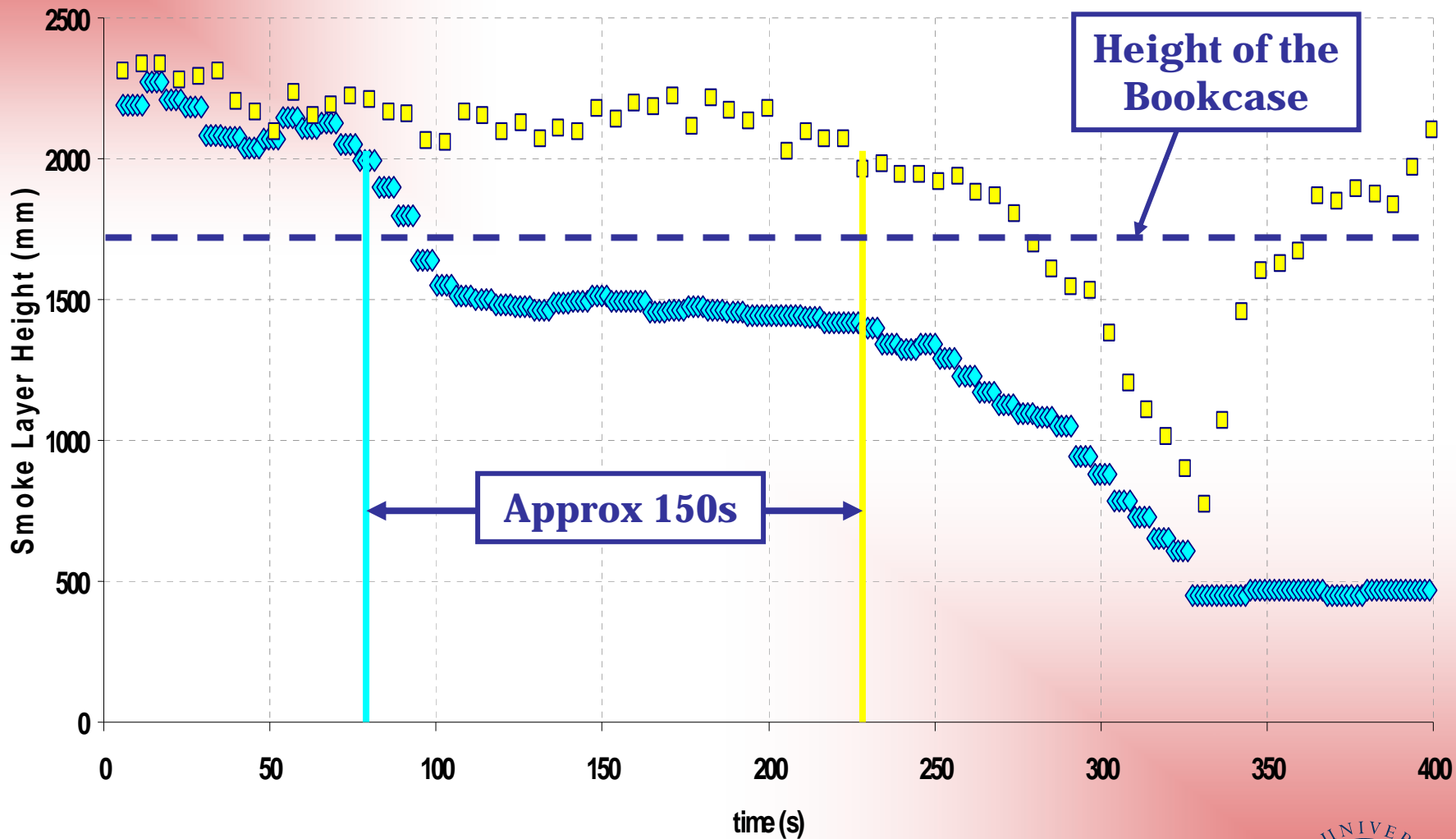




# TEST 1 vs. TEST 2 - Average TC Temperature



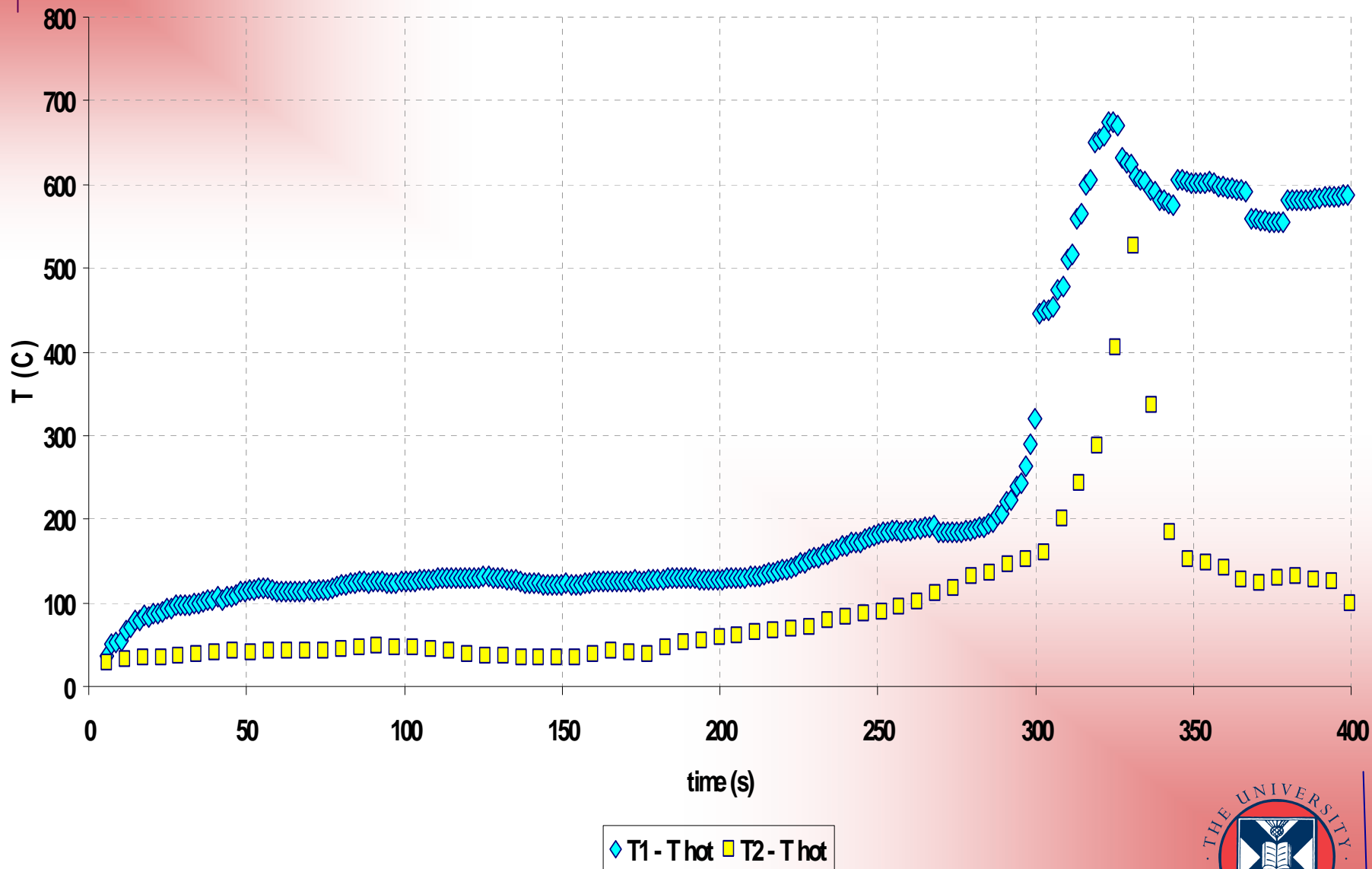
# TEST 1 vs. TEST 2 - Smoke Layer Height



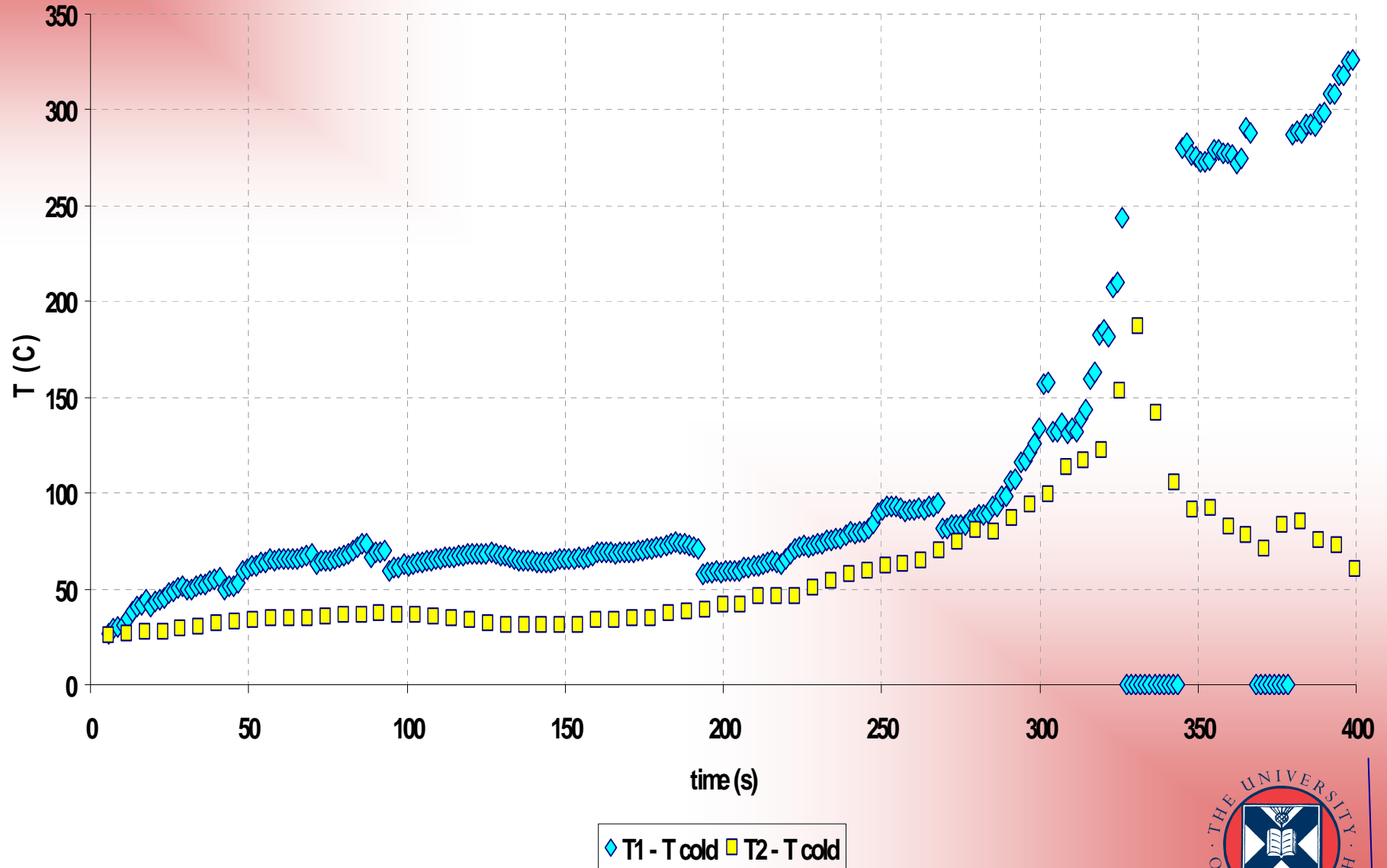
◆ T1 - Layer Height    ■ T2 - Layer Height



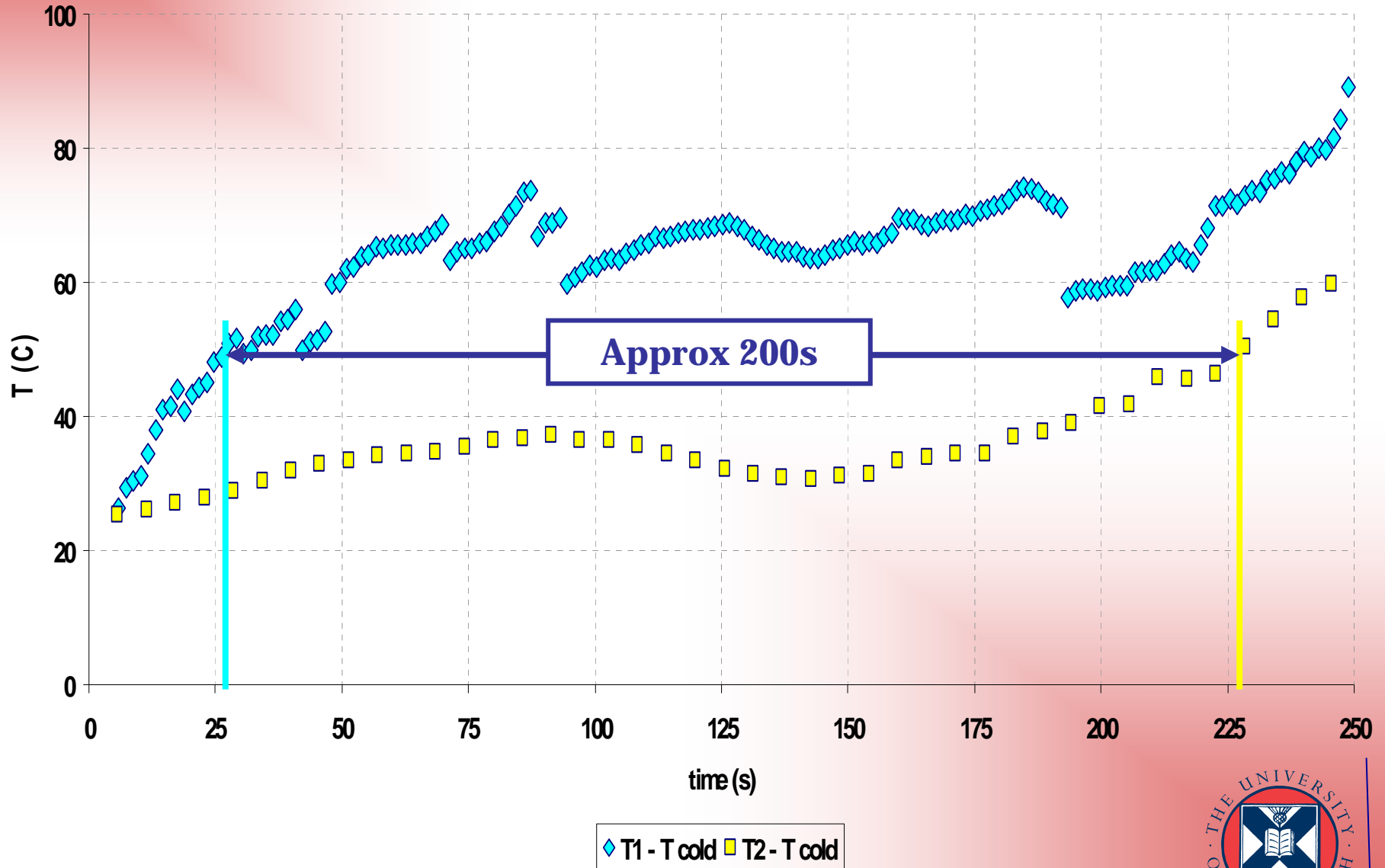
# TEST 1 vs. TEST 2 - The Hot Layers



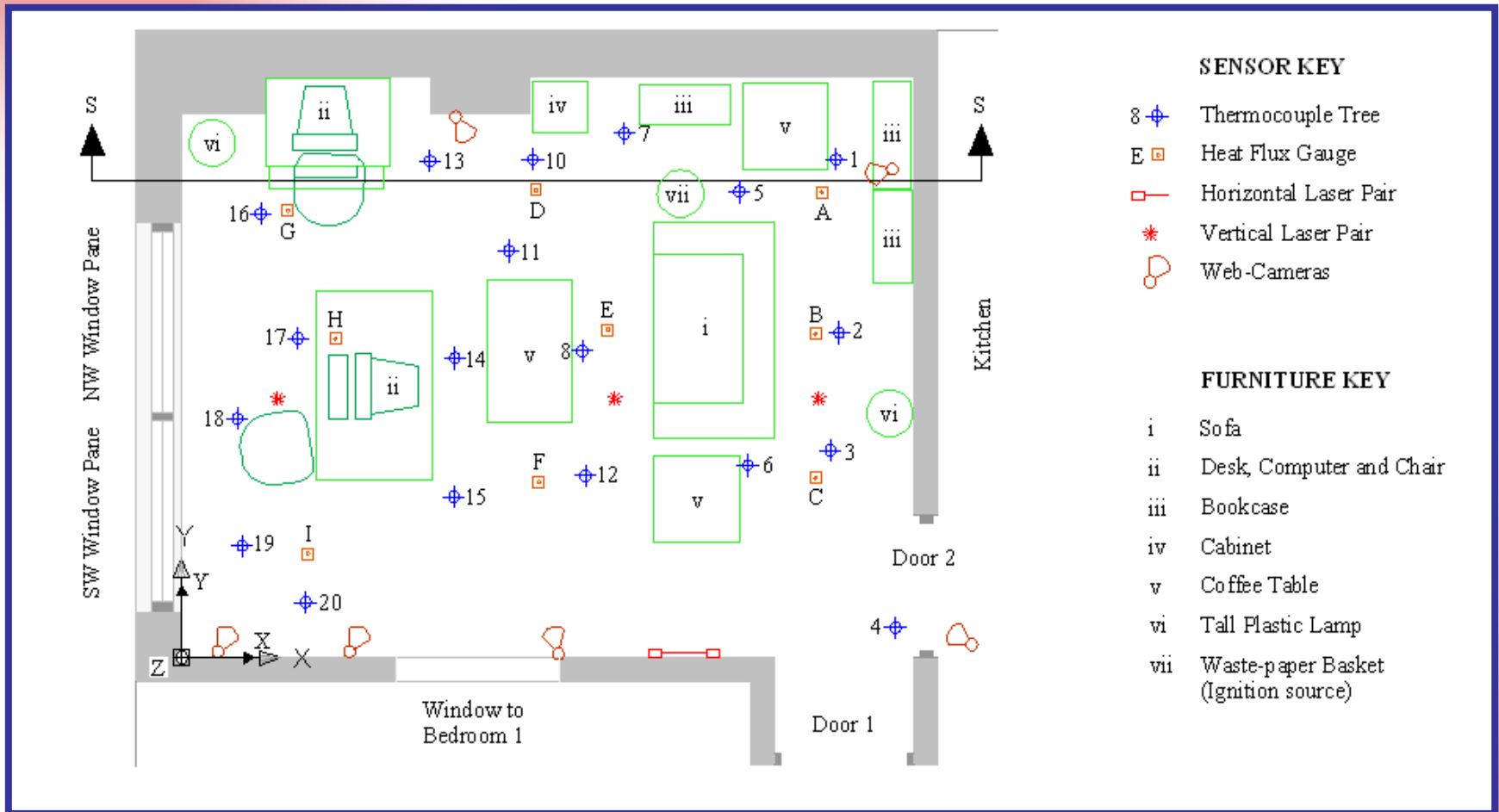
# TEST 1 vs. TEST 2 - The Cold Layers



# TEST 1 vs. TEST 2 - The Cold Layers



# TEMPERATURE SLICES



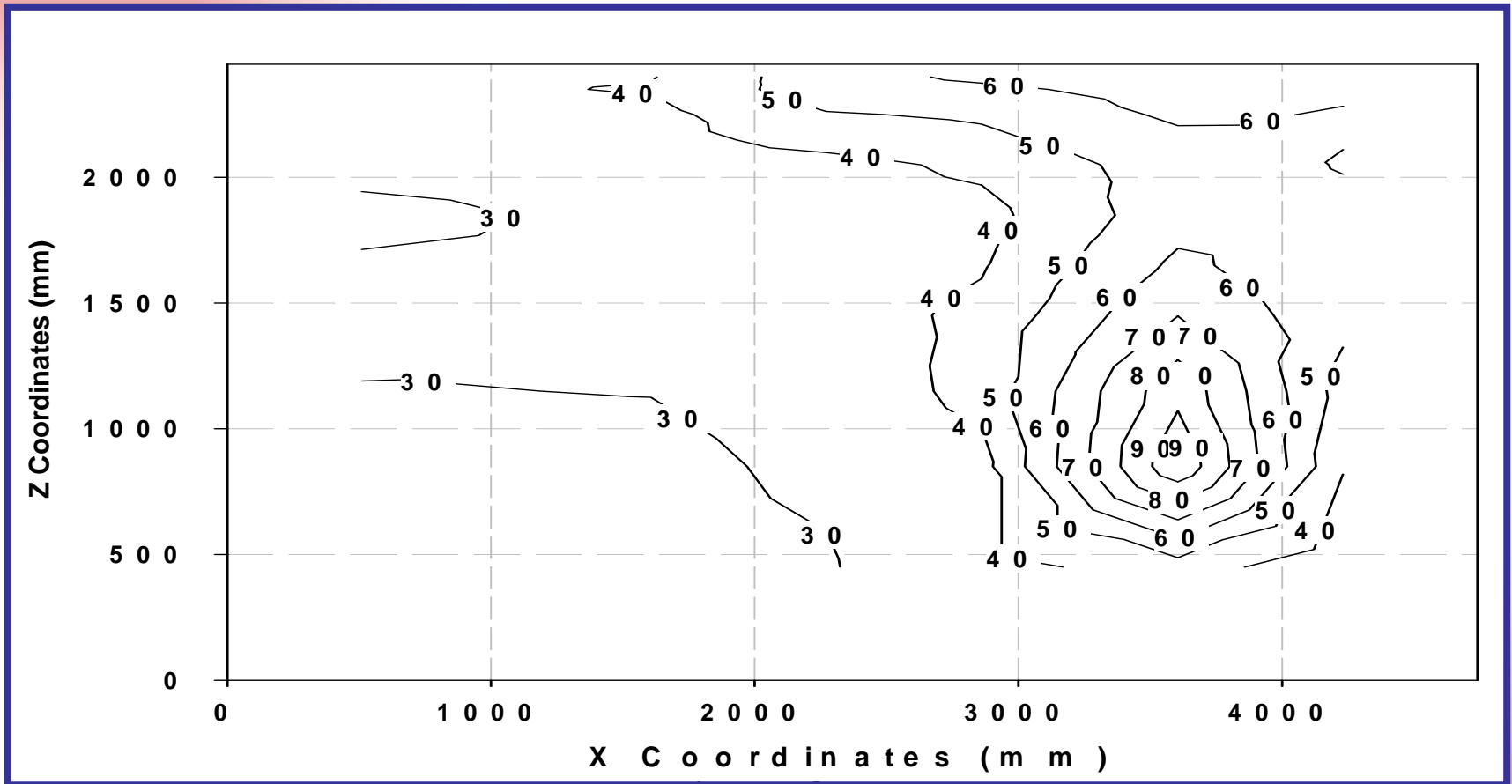
# TEMPERATURE SLICE 1



**90 Seconds post ignition**



# TEMPERATURE SLICE 1



**90 Seconds post ignition**





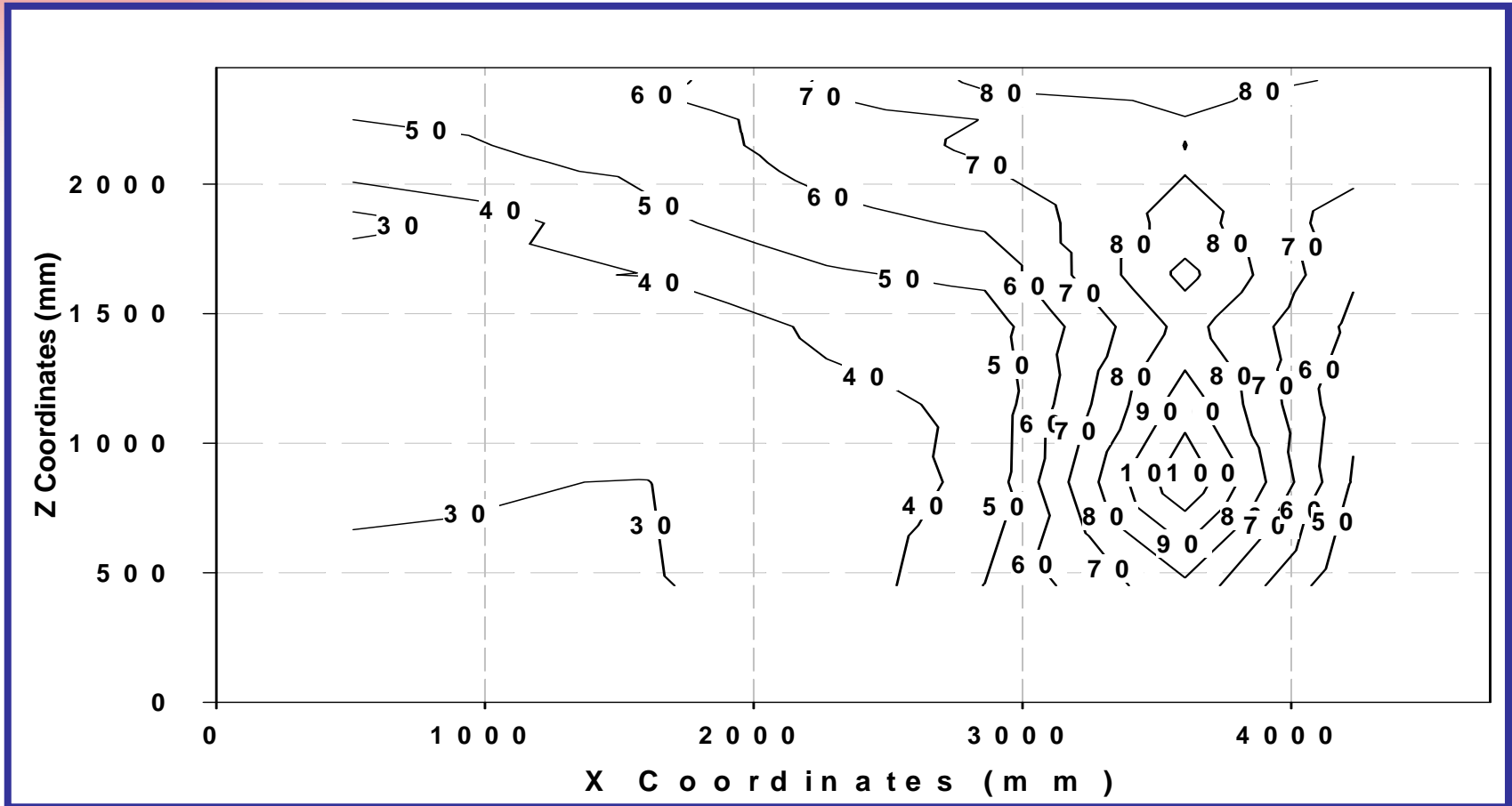
## TEMPERATURE SLICE 2



**200 Seconds post ignition**



# TEMPERATURE SLICE 2



**200 Seconds post ignition**



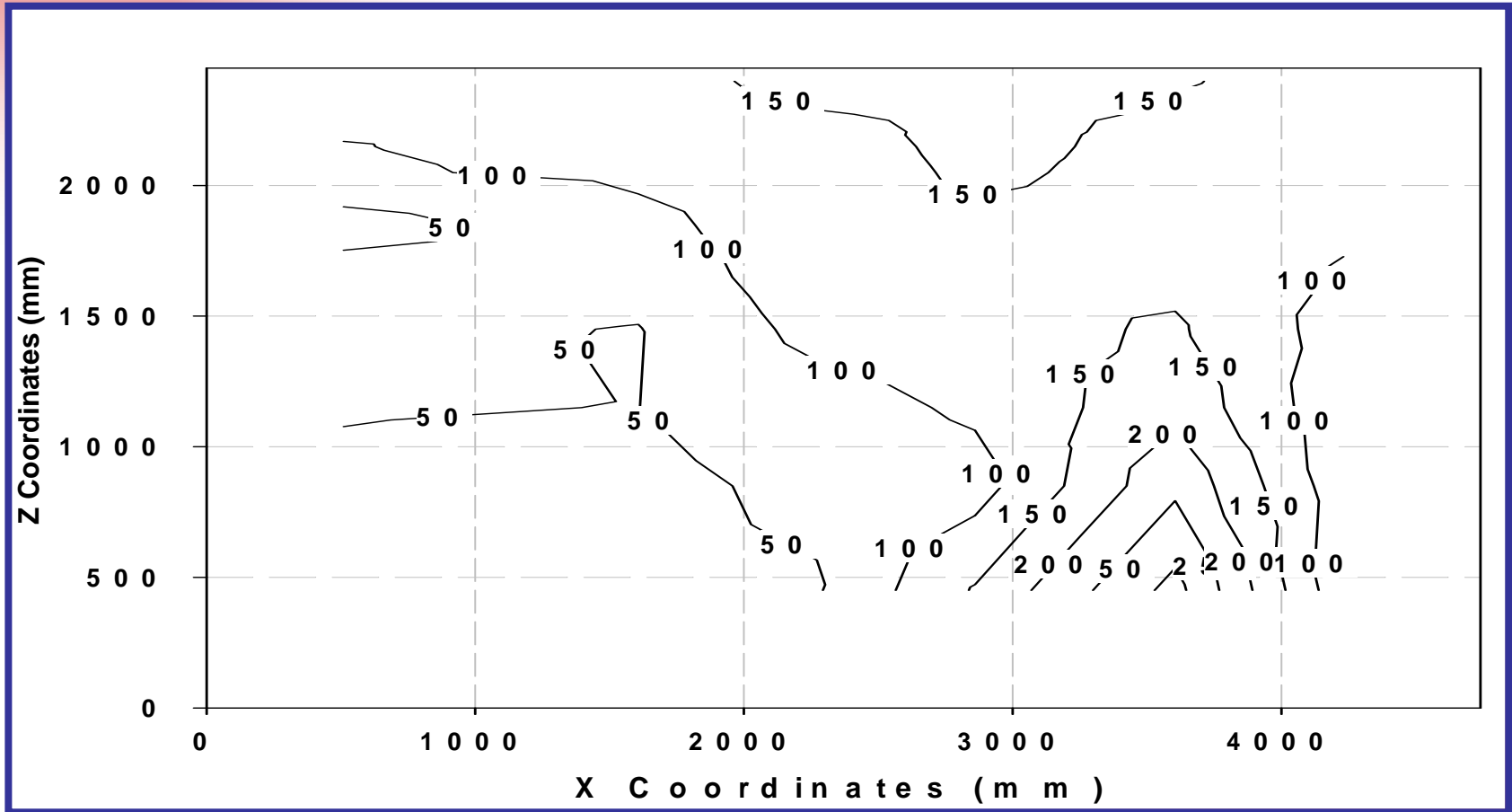
# TEMPERATURE SLICE 3



**268 Seconds post ignition**



# TEMPERATURE SLICE 3



**268 Seconds post ignition**



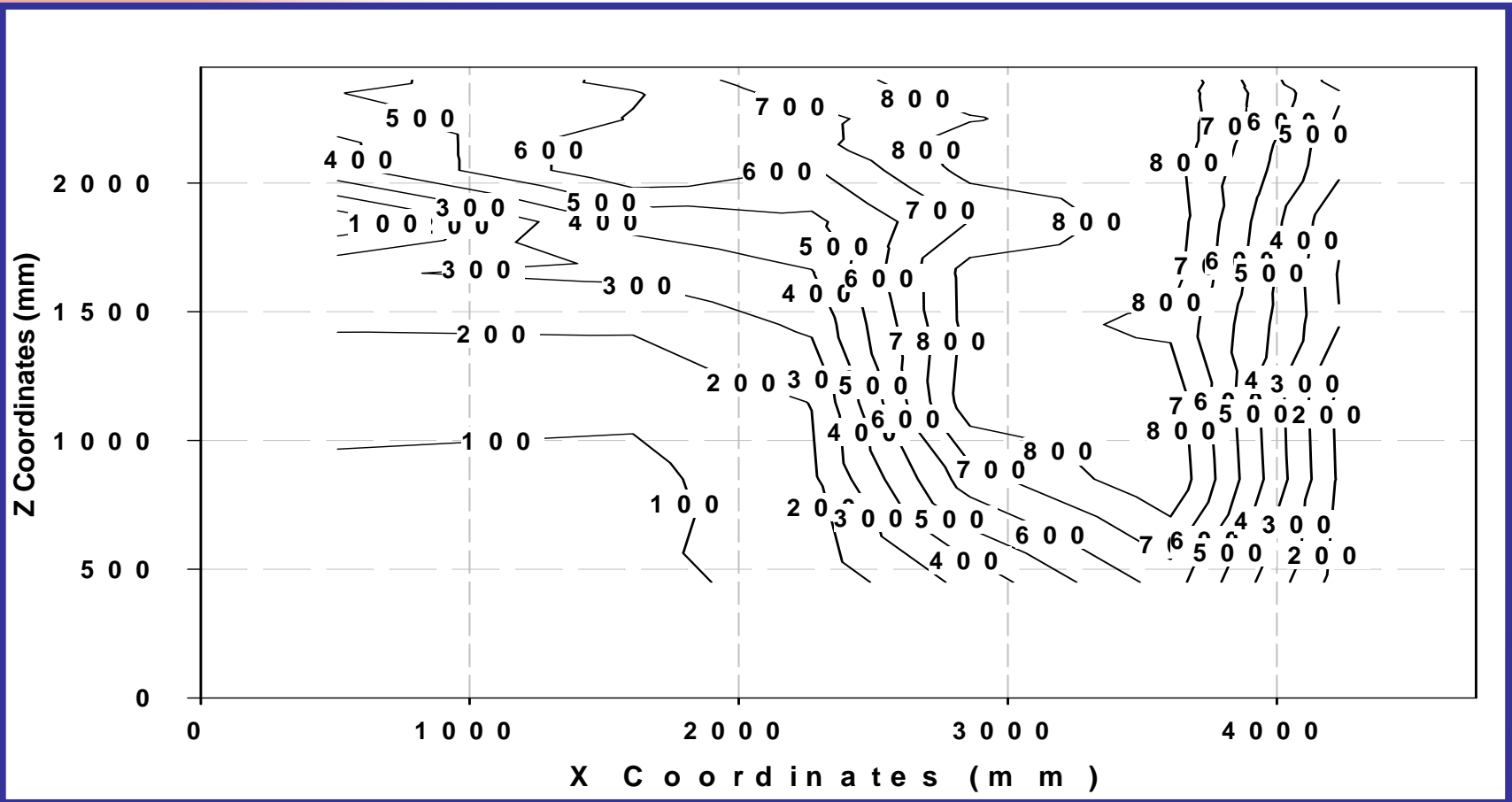
# TEMPERATURE SLICE 4



**325 Seconds post ignition**



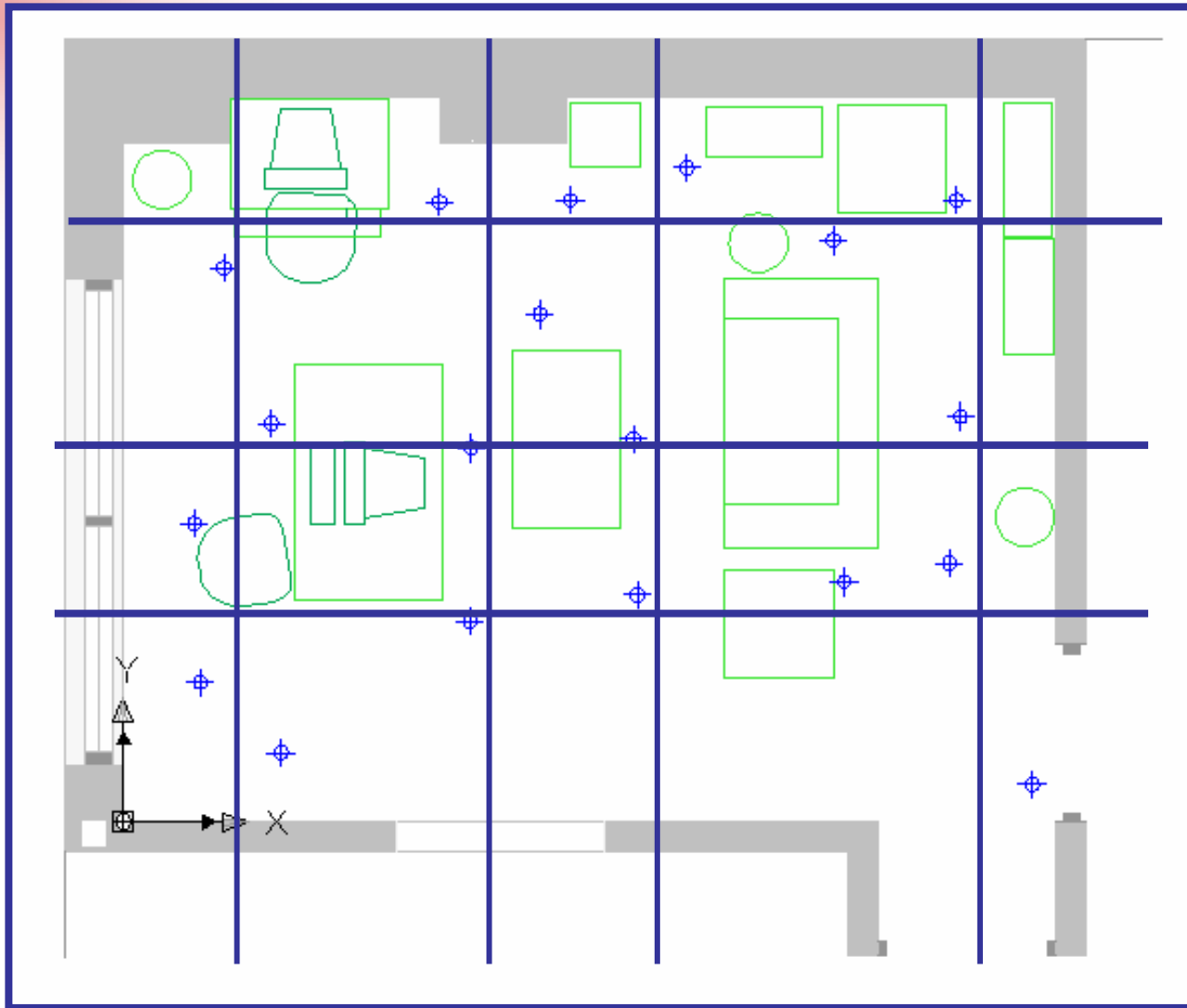
# TEMPERATURE SLICE 4



**325 Seconds post ignition**



# TEMPERATURE SLICES



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# CONCLUSIONS

- **Conditions in Test 2 remained tenable far longer than in Test 1 (w.r.t. Temperature).**
- **Positive implications for the FireGrid project in terms of our ability to affect a pre-flashover fire.**
- **Comparison of Tests 1 and 2 shows a robust test setup that leads to a good level of repeatability.**
- **A high sensor density and thorough characterisation of the events provides ample results for validation of field models.**





# STILL AT LARGE

