
Appendix 3.5 – EXPERIMENTAL RESULTS FROM UNIVERSITY OF GLASGOW

by

Frank N. Coton, Shabudin Bin Mat, Roderick A.McD. Galbraith

This appendix is related to Chapter 22. It contains flow visualisation and force and moment data measured on the VFE-2 configurations at the University of Glasgow. In the case of flow visualisation, the images are presented as a time series of the developing flow. The final image in each series represents the point at which the flow pattern on the wing stopped changing. Flow visualisation data are presented for the medium-radius edged wing at Reynolds numbers of 1×10^6 and 2×10^6 and for the sharp-edged wing at a Reynolds number of 2×10^6 . For both wings, data are presented at angles of attack 13.3° , 18.5° and 23° . Force and moment data are presented as time averaged, uncorrected data with the exception of one case where the time series measured by the data collection system is provided to indicate the unsteadiness of the loads.

A3.5.1 FLOW VISUALISATION DATA

A3.5.1.1 Angle of Attack, $\alpha = 13.3^\circ$

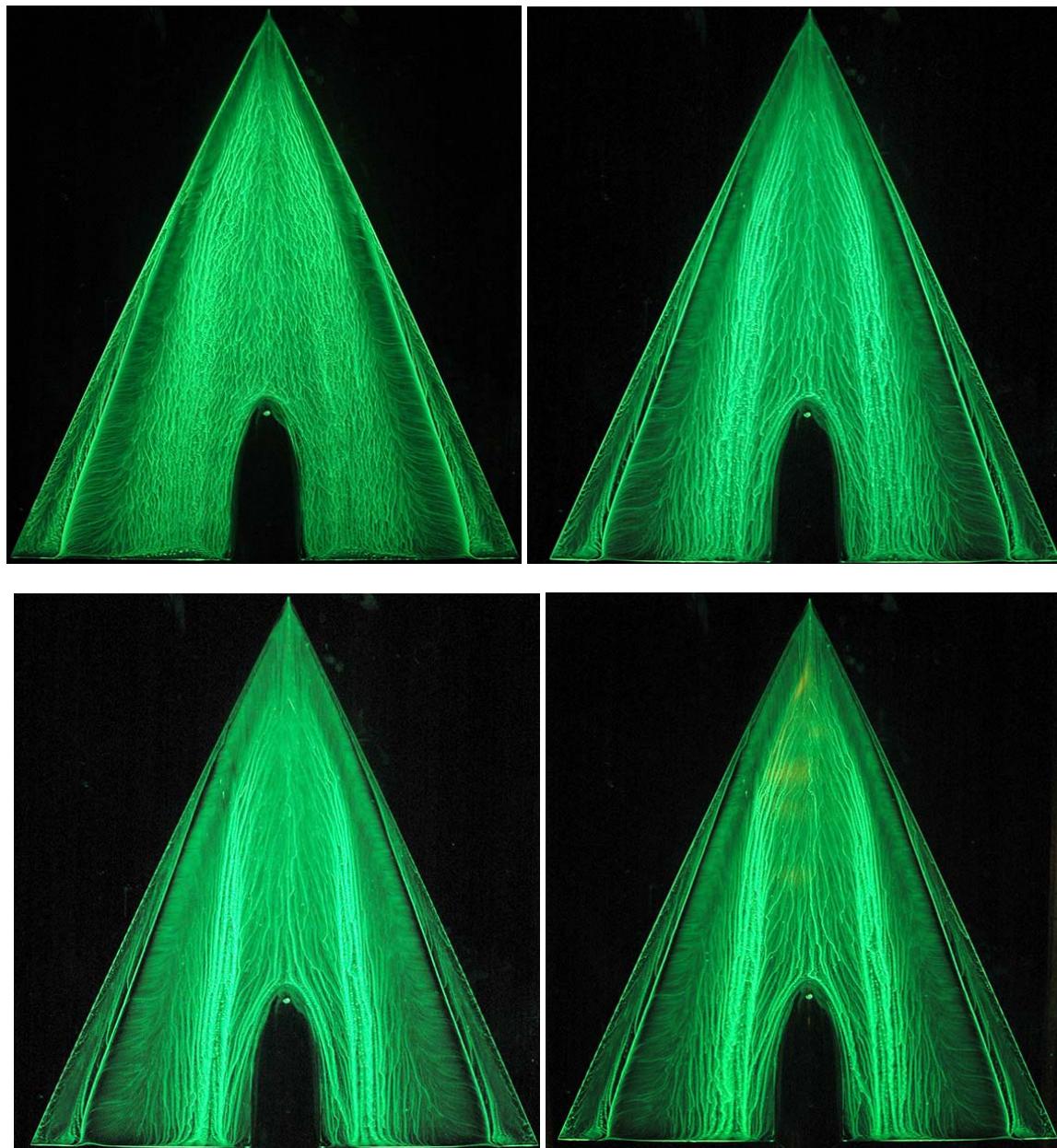


Figure A3.5-1: Development of the Flow Topology on the
Medium-Radius Wing at $\alpha = 13.3^\circ$ and $R_{mac} = 1 \times 10^6$.

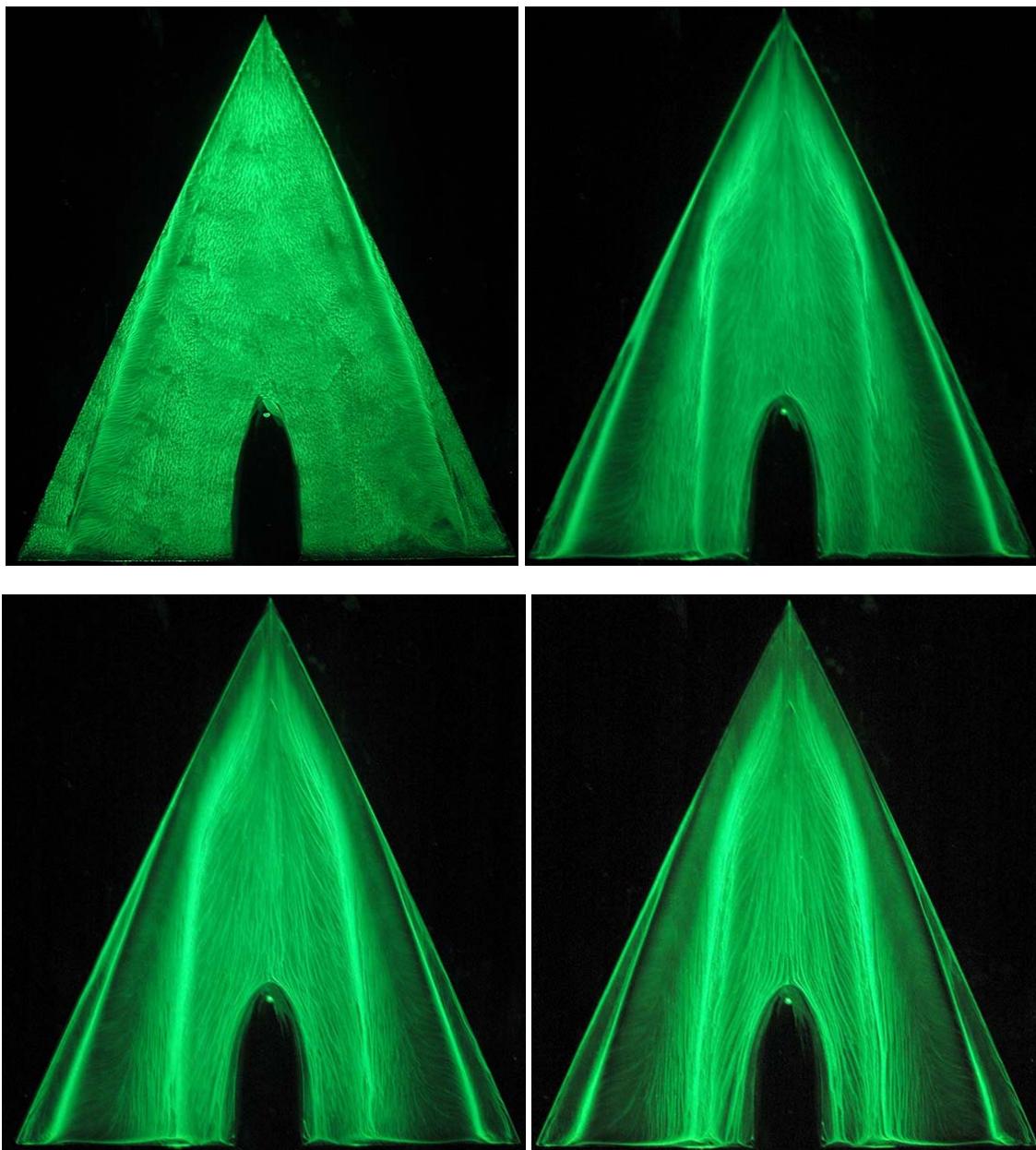


Figure A3.5-2: Development of the Flow Topology on the Medium-Radius Wing at $\alpha = 13.3^\circ$ and $R_{mac} = 2 \times 10^6$.

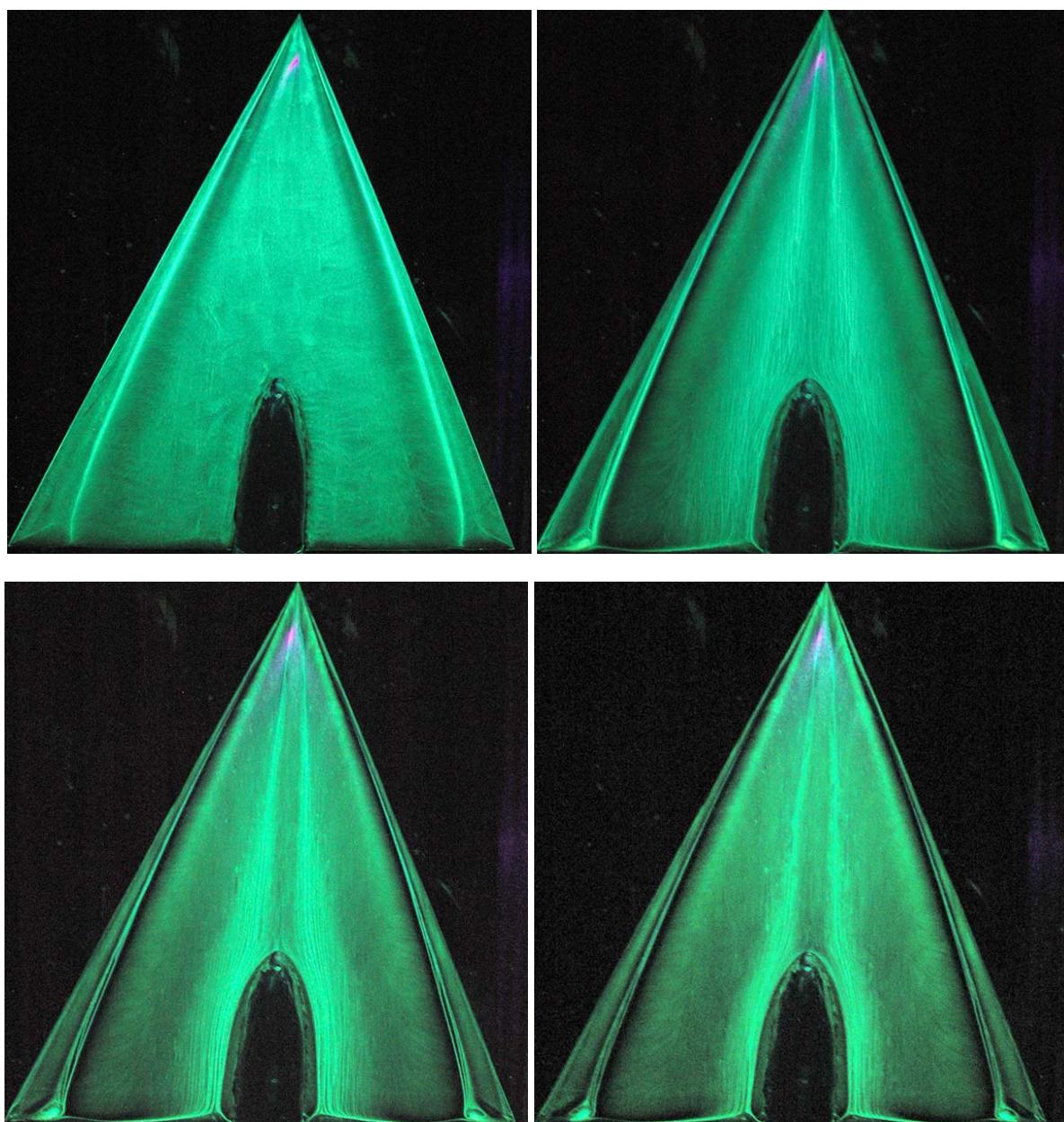


Figure A3.5-3: Development of the Flow Topology on the Sharp-Edged Wing at $\alpha = 13.3^\circ$ and $R_{mac} = 2 \times 10^6$.

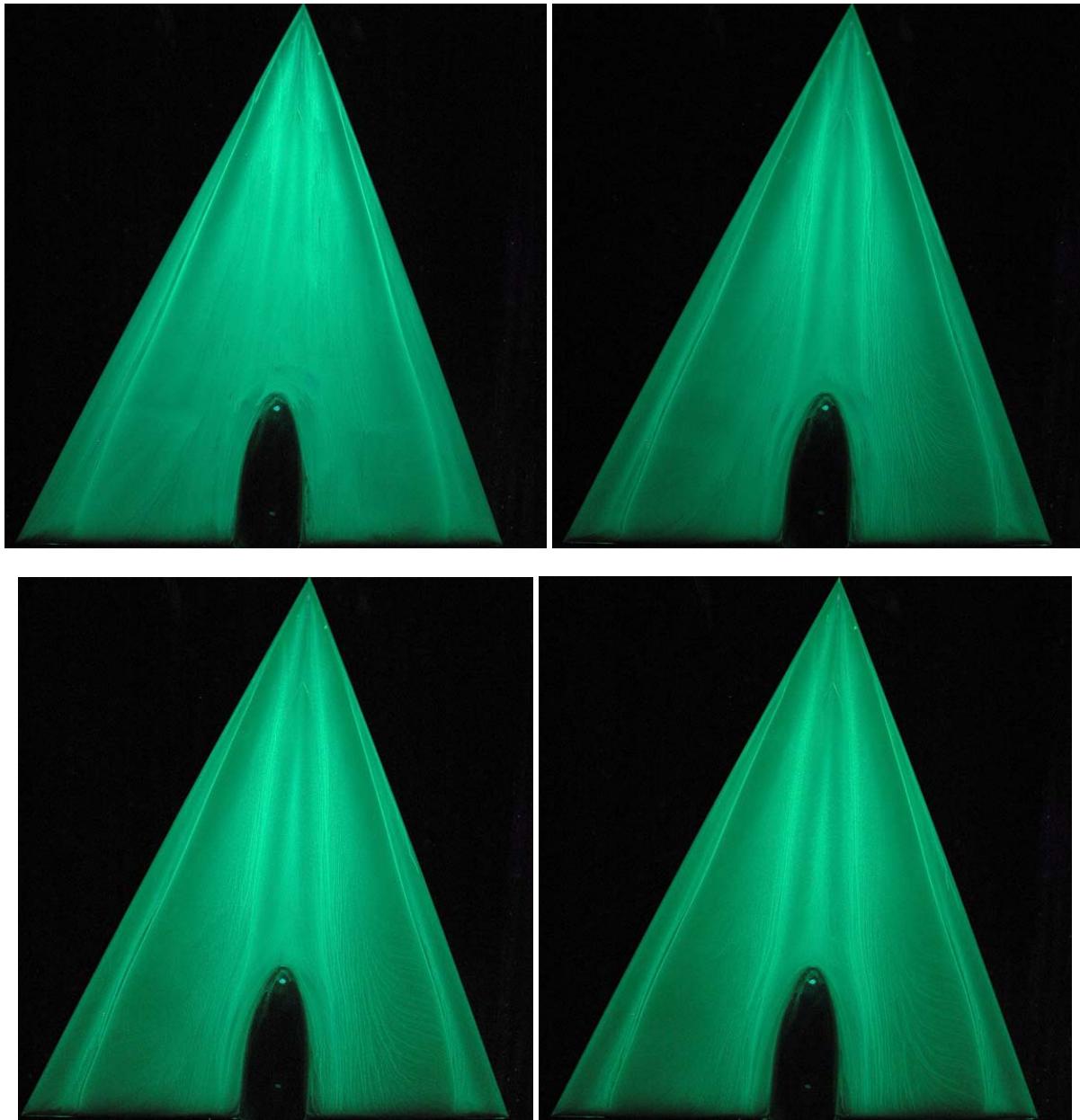
A3.5.1.2 Angle of Attack, $\alpha = 18.5^\circ$ 

Figure A3.5-4: Development of the Flow Topology on the Medium-Radius Wing at $\alpha = 18.5^\circ$ and $R_{mac} = 1 \times 10^6$.

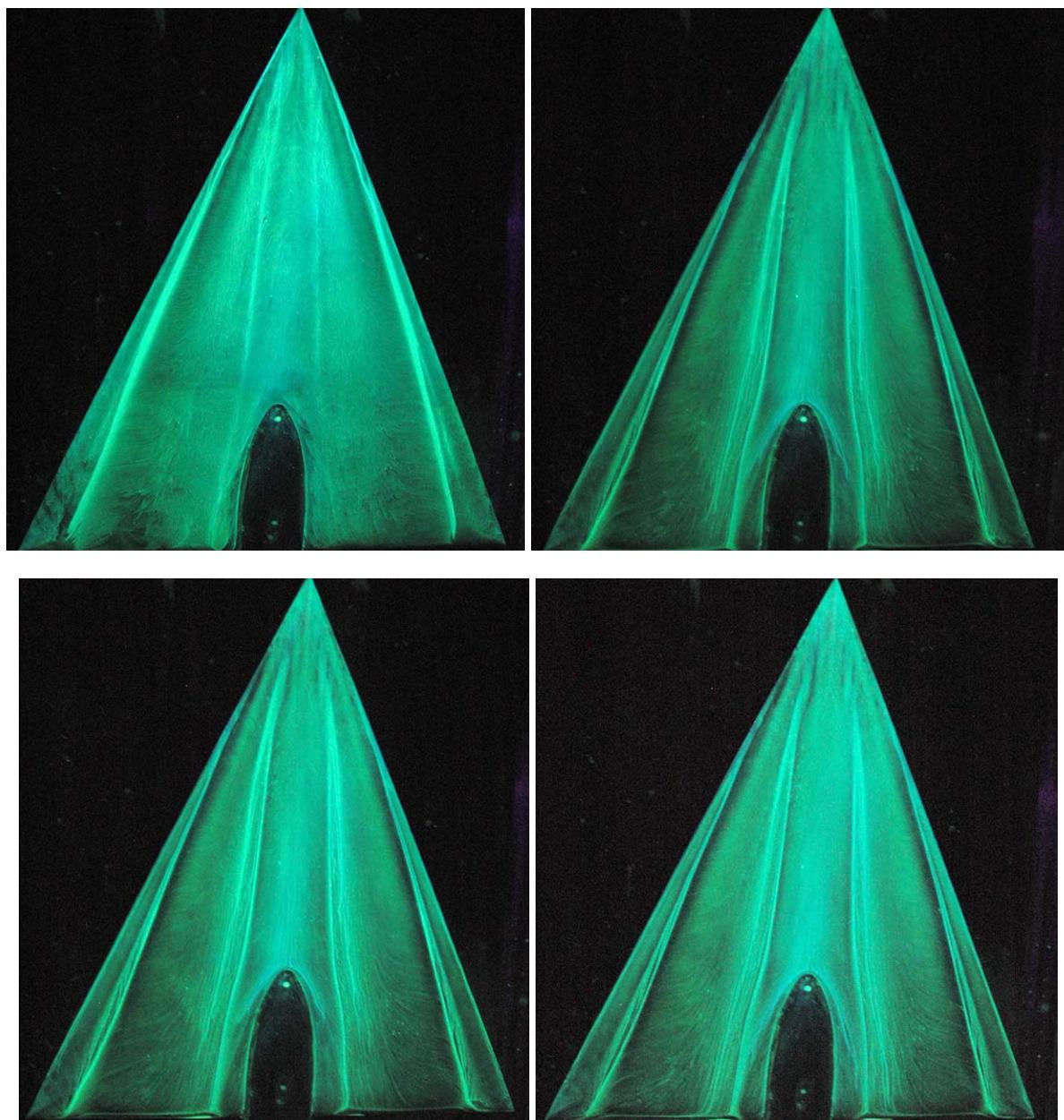


Figure A3.5-5: Development of the Flow Topology on the
Medium-Radius Wing at $\alpha = 18.5^\circ$ and $R_{mac} = 2 \times 10^6$.

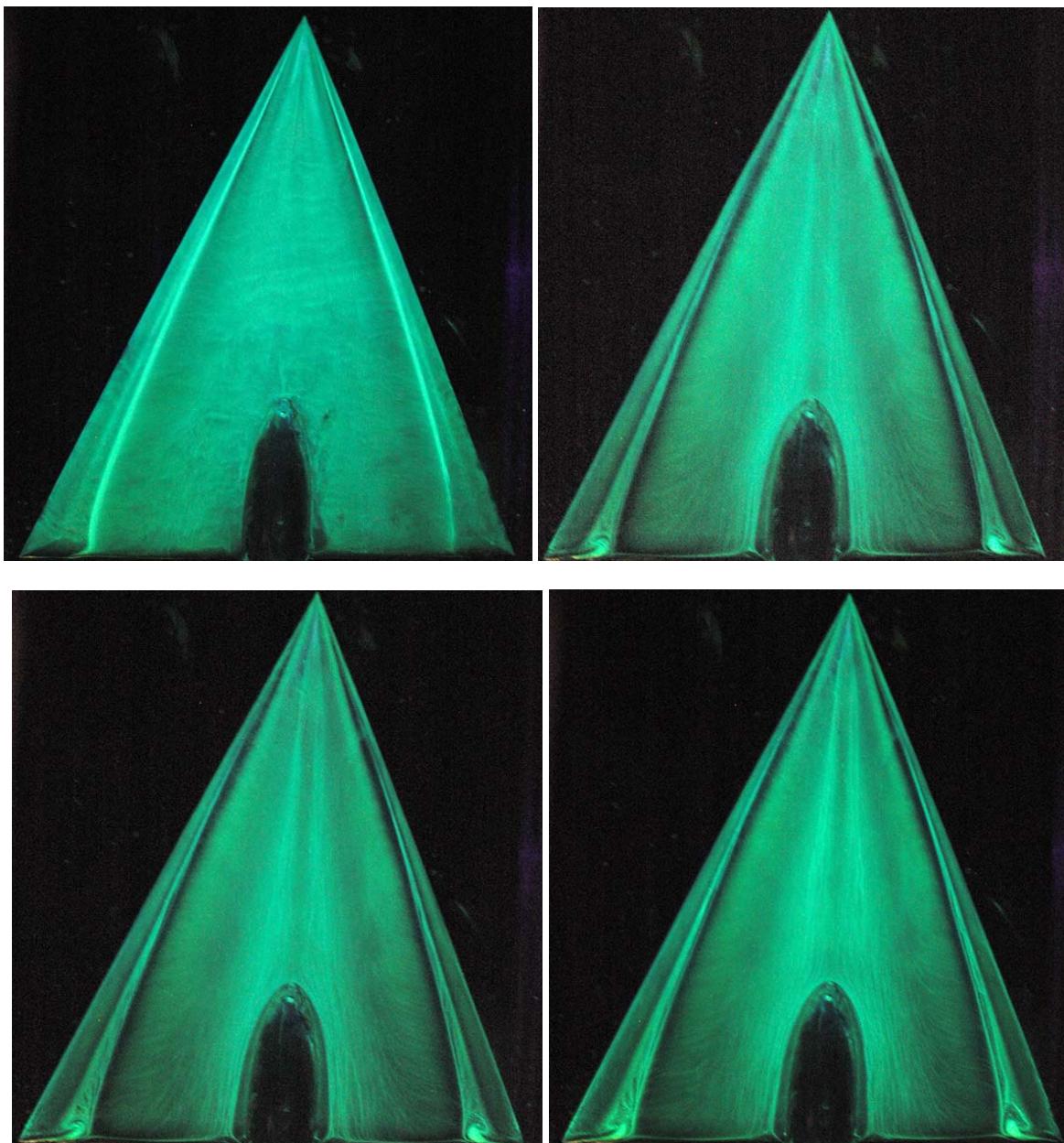
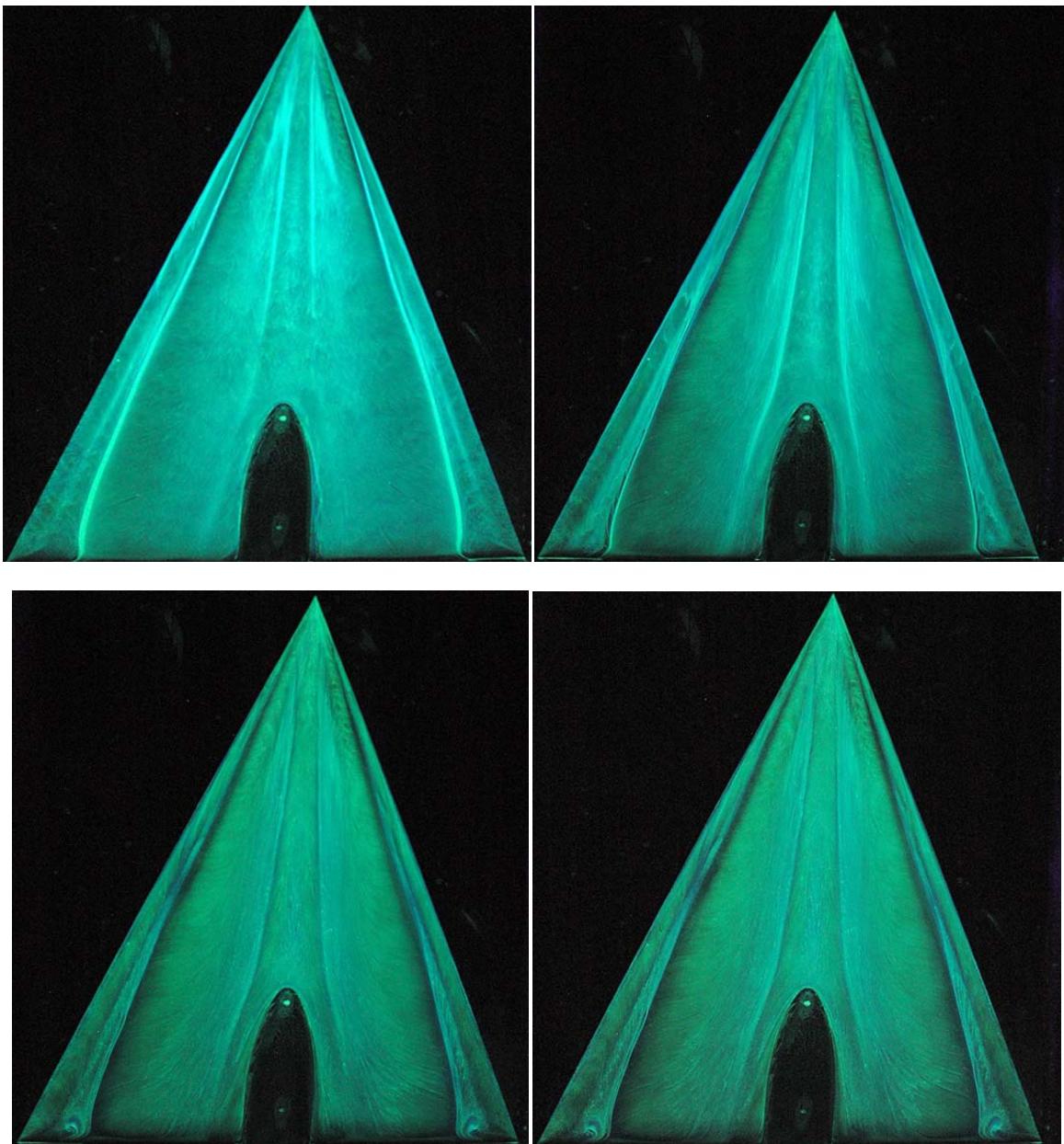


Figure A3.5-6: Development of the Flow Topology on the Sharp-Edged Wing at $\alpha = 18.5^\circ$ and $R_{mac} = 2 \times 10^6$.

A3.5.1.3 Angle of Attack, $\alpha = 23^\circ$



**Figure A3.5-7: Development of the Flow Topology on the
Medium-Radius Wing at $\alpha = 23^\circ$ and $R_{mac} = 1 \times 10^6$.**

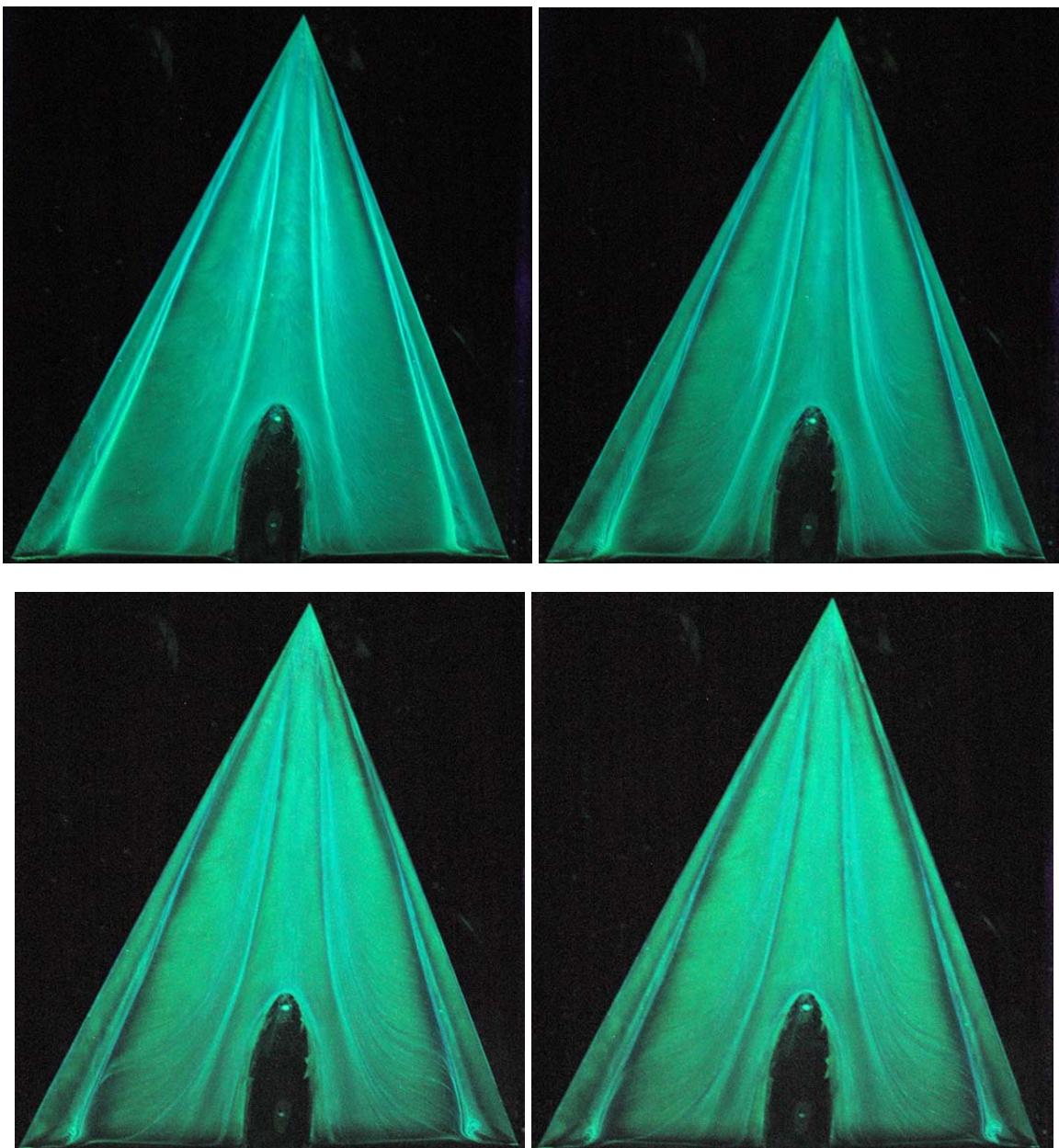


Figure A3.5-8: Development of the Flow Topology on the Medium-Radius Wing at $\alpha = 23^\circ$ and $R_{mac} = 2 \times 10^6$.

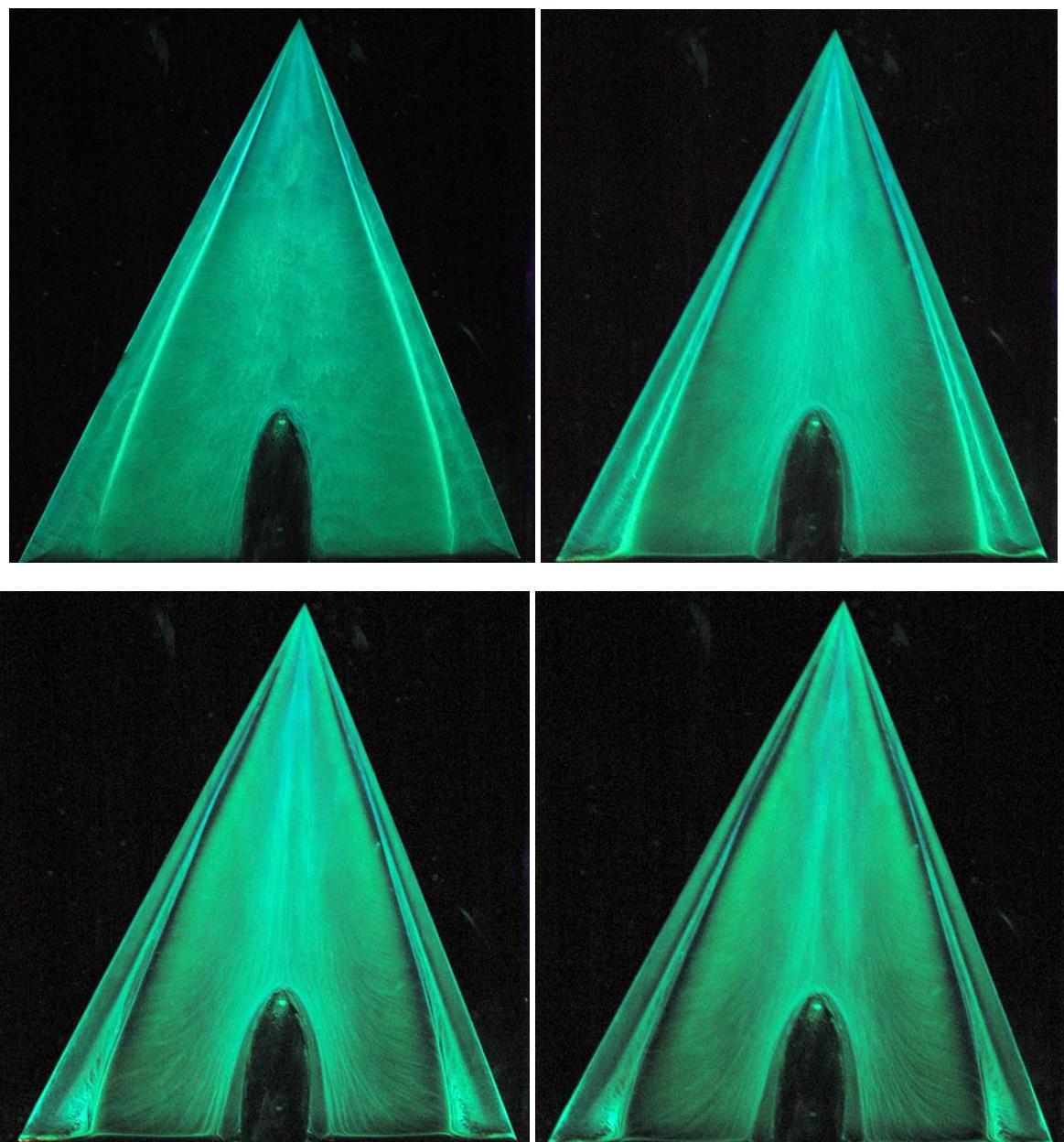


Figure A3.5-9: Development of the Flow Topology on the
Sharp-Edged Wing at $\alpha = 23^\circ$ and $R_{mac} = 2 \times 10^6$.

A3.5.2 STEADY FORCE AND MOMENT COEFFICIENTS FOR VFE-2 WING CONFIGURATIONS

A3.5.2.1 Medium Radius Wing

Table A3.5-1: Time Averaged Force and Moment Coefficients for Medium Radius Wing

α	$R_{mac} = 1 \times 10^6$			$R_{mac} = 2 \times 10^6$		
	C_N	C_A	C_M	C_N	C_A	C_M
13.3	0.58145916	0.1839282	-0.07577118	0.5559778	0.1545126	-0.07538
15.5	0.683607	0.2162924	-0.101998	0.6401042	0.175724	-0.096514
17	0.770599	0.24486	-0.11098	0.7279008	0.2170232	-0.110004
18.5	0.8438178	0.274565	-0.136166	0.7854936	0.2130722	-0.134712
20	0.9037188	0.2856268	-0.157664	0.898526	0.224118	-0.143176
22	1.0040172	0.3260496	-0.191636	1.01905402	0.2446008	-0.164536
23	1.0437962	0.335031	-0.197492	1.0113132	0.2382516	-0.164536
25	1.1878362	0.3662968	-0.211364	1.1948814	0.2558062	-0.190192

A3.5.2.2 Sharp Edged Wing

Table A3.5-2: Time Averaged Force and Moment Coefficients for Sharp Edged Wing, $R_{mac} = 2 \times 10^6$

α	C_N	C_A	C_M
13.3	0.548833	0.169993	-0.09728
18.5	0.833557	0.229252	-0.15045
23	1.074284	0.263991	-0.19924

A3.5.3 UNSTEADY FORCE AND MOMENT COEFFICIENTS

The table below contains load cell data collected at 8 kHz for a period of one twentieth of a second for the case of the medium radius wing at an angle of attack of 13.3 degrees and a Reynolds number of two million. These data are provided as an example of the collected unsteady force and moment coefficient data. A typical case would have data for one second collected at 8 kHz.

**Table A3.5-3: Force and Moment Coefficients Measured at 8 kHz
for the Medium Radius Wing at $\alpha = 13.3^\circ$ and $R_{mac} = 2 \times 10^6$**

C_N	C_A	C_M
0.575462793	0.153392346	-0.073024953
0.574921315	0.161820315	-0.073413899
0.57463121	0.169522981	-0.073577726
0.574645172	0.174901823	-0.073718008
0.574963049	0.178849965	-0.073753473
0.575169958	0.181357061	-0.073877574
0.575504919	0.182138592	-0.073920856
0.575537574	0.181164069	-0.074051668
0.576007128	0.178772827	-0.074026958
0.576417623	0.176208647	-0.073950701
0.576520059	0.173054847	-0.074144378
0.576478355	0.169749397	-0.074362115
0.576317903	0.165671502	-0.074656416
0.576152818	0.162258473	-0.07493719
0.57563797	0.15836924	-0.075476412
0.574753758	0.155853641	-0.07605552
0.573374845	0.152556055	-0.07691698
0.571780041	0.149002432	-0.077903778
0.570157735	0.145187982	-0.078920559
0.569010664	0.141153301	-0.079794731
0.568608124	0.137827612	-0.080162042
0.56886449	0.135330869	-0.080277732
0.569574285	0.134652626	-0.080115308
0.570573067	0.136112111	-0.079839454
0.571828457	0.138896235	-0.079450135
0.573202086	0.142464904	-0.078984744
0.574545547	0.146565495	-0.078550629
0.575764368	0.15079958	-0.078179634
0.576681547	0.15394866	-0.077912024
0.577498262	0.156614648	-0.077776532
0.578153236	0.15776421	-0.077608663
0.578489163	0.15616389	-0.077667027
0.578301258	0.153742297	-0.077940998
0.57728052	0.150111198	-0.078603069
0.575719057	0.145823046	-0.079538249
0.573968895	0.140344738	-0.080568691
0.572512151	0.13540977	-0.081483368
0.570974339	0.129780552	-0.082389829
0.569552932	0.125467262	-0.083221173

C_N	C_A	C_M
0.568213844	0.122512567	-0.084076142
0.566966403	0.122203409	-0.084884921
0.56599105	0.123589998	-0.085523638
0.565459747	0.127101575	-0.085954321
0.565491543	0.133397049	-0.08610065
0.566271292	0.140918229	-0.085934337
0.567143203	0.148385762	-0.085623618
0.568188384	0.156685075	-0.085274506
0.568872051	0.164302997	-0.085059378
0.569104356	0.17258053	-0.085056122
0.569059361	0.179536887	-0.085209056
0.568712822	0.184599261	-0.085464847
0.568423689	0.187969686	-0.085756626
0.567828621	0.190242597	-0.086137616
0.566877145	0.189701471	-0.086649664
0.565540192	0.188490994	-0.08734007
0.5640686	0.183806393	-0.088049431
0.562696285	0.177724117	-0.088806426
0.561378089	0.170639647	-0.089405659
0.560663429	0.163351717	-0.089797897
0.560974857	0.15563054	-0.089606657
0.561942296	0.147954402	-0.089149405
0.563672899	0.14206993	-0.088420928
0.565431657	0.138843334	-0.087678678
0.566837619	0.138357685	-0.087033267
0.568316742	0.140461471	-0.086481556
0.569410215	0.145032631	-0.086027148
0.570900421	0.151620166	-0.085421593
0.572620024	0.158755467	-0.084732634
0.574093953	0.16651571	-0.084102585
0.575183774	0.172939034	-0.083650086
0.575946584	0.178997378	-0.083427784
0.576293131	0.183721691	-0.083399331
0.576067412	0.187237411	-0.083643553
0.575621713	0.188098432	-0.083998424
0.574903113	0.187858705	-0.084425856
0.57391721	0.186185094	-0.085036964
0.573067998	0.183591813	-0.085611172
0.572385396	0.17975513	-0.086019586
0.571919455	0.176096418	-0.086400016
0.57142686	0.171731131	-0.086712348
0.57112464	0.168027464	-0.086928648

**APPENDIX 3.5 – EXPERIMENTAL
RESULTS FROM UNIVERSITY OF GLASGOW**



C_N	C_A	C_M
0.571252032	0.164434307	-0.086895071
0.572033264	0.160947174	-0.086498403
0.57306098	0.157572732	-0.08596064
0.574243666	0.155126025	-0.085344601
0.575544992	0.15294632	-0.08465246
0.576625525	0.151829692	-0.084072201
0.578128476	0.151548777	-0.083327566
0.580213189	0.152018731	-0.082223867
0.582516878	0.15373273	-0.08110727
0.584691718	0.15670841	-0.079957935
0.585939656	0.161183199	-0.07935832
0.585737337	0.166417397	-0.079426185
0.584347041	0.172607382	-0.080143272
0.582270591	0.17783424	-0.081141711
0.580234633	0.182599569	-0.082233906
0.578236354	0.186661589	-0.083225672
0.576235205	0.189042468	-0.084284233
0.574026887	0.190659468	-0.085480401
0.571752961	0.191343147	-0.086693484
0.569657766	0.190733932	-0.087865248
0.567908775	0.189321071	-0.088845877
0.566439455	0.187898621	-0.089668886
0.565211097	0.186906165	-0.090419364
0.564217426	0.186282799	-0.09100231
0.564086824	0.186999191	-0.091165972
0.5645562	0.188382447	-0.091026662
0.565555605	0.19054996	-0.09060321
0.566306816	0.193528088	-0.09032175
0.566642858	0.196324214	-0.09015225
0.566356731	0.199145009	-0.090329855
0.566317413	0.199830898	-0.090350119
0.566710638	0.198954145	-0.090200713
0.567408243	0.197115294	-0.089848512
0.568078832	0.193025252	-0.089509835
0.568187954	0.187350185	-0.089470907
0.567879491	0.180119712	-0.089708044
0.567561194	0.172073691	-0.089917439
0.567223676	0.164182167	-0.090169326
0.567098355	0.157332617	-0.090297471
0.567212661	0.152903945	-0.09036995
0.567544923	0.151207316	-0.090250733
0.568179208	0.151671765	-0.090044343

C_N	C_A	C_M
0.568841852	0.154264327	-0.089823989
0.569293083	0.157145426	-0.089743178
0.569682703	0.161570079	-0.089612119
0.56972353	0.167193382	-0.089673409
0.569688841	0.174305545	-0.089838039
0.569358894	0.180463514	-0.090118923
0.568622979	0.185026164	-0.090604785
0.567598796	0.188379256	-0.091219733
0.566372929	0.19037563	-0.091903398
0.564981117	0.192086372	-0.092654225
0.563705408	0.192969942	-0.093313363
0.562852497	0.191872641	-0.093790953
0.562421465	0.188737437	-0.093973771
0.562166556	0.184839511	-0.094116524
0.562136678	0.181426865	-0.094064168
0.562032253	0.176844583	-0.094098288
0.561764299	0.172128975	-0.094198839
0.561594921	0.168438507	-0.094168504
0.561454793	0.165601151	-0.094205406
0.561546444	0.163325711	-0.094158174
0.561390054	0.16114531	-0.094155032
0.560862638	0.159464026	-0.094274278
0.56016022	0.158744258	-0.094531116
0.559257718	0.158011745	-0.09485659
0.558409961	0.1568717	-0.095122073
0.557813498	0.156927269	-0.095260727
0.557206286	0.157767378	-0.095372549
0.556514081	0.159030599	-0.09556012
0.555670033	0.162089917	-0.095938953
0.554566324	0.164957153	-0.096334961
0.553657689	0.168227938	-0.096648681
0.552805629	0.173079702	-0.096917723
0.552078996	0.178595171	-0.097123425
0.551391996	0.184516805	-0.097325577
0.550934692	0.190124601	-0.097330238
0.551049033	0.195913522	-0.097143779
0.551577143	0.201786963	-0.096666629
0.552468892	0.206348239	-0.096038233
0.553166034	0.209041015	-0.095491476
0.553595381	0.209496129	-0.095112489
0.553472224	0.20819807	-0.094963506
0.553194364	0.204192648	-0.094794604

**APPENDIX 3.5 – EXPERIMENTAL
RESULTS FROM UNIVERSITY OF GLASGOW**



C_N	C_A	C_M
0.55314756	0.197459588	-0.094606733
0.553358633	0.188548486	-0.094190601
0.553552994	0.177528498	-0.093815211
0.554094777	0.165706726	-0.093263942
0.554950029	0.15339805	-0.092635709
0.556301218	0.142132509	-0.091740388
0.558165142	0.13241816	-0.090520833
0.560009189	0.125116366	-0.089360431
0.561520497	0.120904629	-0.088433672
0.562631204	0.120394831	-0.087677044
0.56361619	0.122156602	-0.087000613
0.564433935	0.126037482	-0.086392723
0.565362414	0.1309679	-0.085696383
0.566225776	0.138027476	-0.085033425
0.566862476	0.144340116	-0.084566392
0.567348379	0.148622122	-0.084093925
0.56771394	0.152113392	-0.083698363
0.567769133	0.15414373	-0.083475428
0.567498512	0.15463522	-0.083302232
0.566936311	0.154304999	-0.083259508
0.566550908	0.153534304	-0.083094133
0.566249015	0.151990336	-0.082951193
0.566162759	0.1503763	-0.082585114
0.565980896	0.149425528	-0.082267422
0.565669961	0.147941328	-0.081998801
0.565303294	0.147217331	-0.08169318
0.565194151	0.146762023	-0.081273625
0.56578578	0.146712945	-0.080516297
0.56682351	0.147465937	-0.079549868
0.568278047	0.147506688	-0.07829119
0.569959336	0.146627031	-0.076918215
0.571396158	0.144701189	-0.075685125
0.57272045	0.143866983	-0.074557926
0.57384628	0.14249418	-0.073498646
0.574353847	0.139951777	-0.072784449
0.574534339	0.137447456	-0.072284834
0.574233623	0.135606806	-0.072012347
0.573539219	0.135748726	-0.0719066
0.572296595	0.136602453	-0.072143409
0.571001817	0.138273705	-0.072439416
0.569724187	0.140241172	-0.072775798
0.568624087	0.14364747	-0.072990065

C_N	C_A	C_M
0.567574402	0.147490828	-0.073244069
0.566577972	0.151045205	-0.073438443
0.565580895	0.15406996	-0.073633039
0.564940881	0.15790308	-0.073679767
0.564683937	0.160668765	-0.073532737
0.564758947	0.162787904	-0.073250665
0.565296377	0.162623091	-0.072685745
0.566464385	0.159841946	-0.071867324
0.568432197	0.15541926	-0.070563145
0.571183231	0.15009536	-0.068928134
0.574147254	0.143953649	-0.067152831
0.576751073	0.137134183	-0.065526794
0.579213737	0.129281077	-0.064004973
0.580787036	0.120504333	-0.062916468
0.582260965	0.111463461	-0.0618621
0.583380174	0.103281377	-0.061068888
0.584184999	0.094922908	-0.060352944
0.58439429	0.086839576	-0.059954269
0.584199331	0.080834647	-0.05969472
0.583590983	0.076213171	-0.059741946
0.582679061	0.073551795	-0.059893828
0.581420526	0.07367935	-0.060237347
0.580274339	0.07551431	-0.060491664
0.579183608	0.080119473	-0.060717759
0.578289871	0.086055201	-0.060876642
0.577338374	0.093004318	-0.060999296
0.576076864	0.101024025	-0.06131097
0.574577551	0.109205639	-0.061791703
0.572910273	0.117959405	-0.062422727
0.571440938	0.126677476	-0.062888441
0.570430039	0.133826903	-0.063155173
0.570130101	0.140200659	-0.063095356
0.570025236	0.146127972	-0.06285542
0.56974586	0.152748788	-0.062752712
0.56929732	0.158692611	-0.062702828
0.568835181	0.163943679	-0.062610895
0.568840959	0.168169086	-0.062347641
0.56912484	0.170250095	-0.061910978
0.569436623	0.171169866	-0.061525475
0.569492993	0.169774089	-0.061154737
0.569519955	0.168307822	-0.060896858
0.569296572	0.166853838	-0.060765893

**APPENDIX 3.5 – EXPERIMENTAL
RESULTS FROM UNIVERSITY OF GLASGOW**



C_N	C_A	C_M
0.569484515	0.164583881	-0.060606603
0.570323211	0.163482354	-0.060070054
0.571668549	0.162840586	-0.059375494
0.57332208	0.163435508	-0.058590862
0.575136497	0.165580586	-0.057643729
0.577384953	0.168300365	-0.056542828
0.579300801	0.171717184	-0.055659047
0.580737097	0.174728151	-0.055001287
0.581598996	0.178261711	-0.054617572
0.582050292	0.181002294	-0.054441302
0.582249446	0.182946836	-0.054392315
0.582404615	0.182926217	-0.054414141
0.582944208	0.180377421	-0.05424134
0.583323832	0.176487509	-0.054132873
0.58367477	0.172466031	-0.054054889
0.583767162	0.168214956	-0.054188689
0.583420906	0.163783455	-0.054462561
0.582808133	0.15925793	-0.054936147
0.581997898	0.154316264	-0.055477018
0.580855806	0.148820672	-0.056136668
0.579633294	0.143966535	-0.056788306
0.578345689	0.140183717	-0.057473136
0.576991442	0.137411339	-0.058094008
0.57567992	0.136264062	-0.058742397
0.574403817	0.136851783	-0.05938946
0.573046204	0.138083689	-0.06002902
0.571445683	0.139867381	-0.06082408
0.569518278	0.142787283	-0.061670328
0.567351829	0.145260092	-0.062768016
0.565080264	0.147713945	-0.063886234
0.562627459	0.15004295	-0.065128229
0.559733459	0.152054582	-0.066511305
0.556644697	0.153774838	-0.067976113
0.553329782	0.155479665	-0.069554596
0.550305324	0.157396643	-0.070920634
0.547432151	0.15942315	-0.072193562
0.545255027	0.162641336	-0.073130818
0.543284745	0.16648812	-0.073914701
0.541575048	0.17048926	-0.074599449
0.54005902	0.174814404	-0.075284416
0.538918774	0.177139862	-0.075762892
0.538591436	0.178220195	-0.075977293

C_N	C_A	C_M
0.538712392	0.177037739	-0.075964855
0.539002361	0.174415477	-0.075899385
0.539512644	0.170138676	-0.075608508
0.540138805	0.166565419	-0.075324435
0.541072856	0.162769683	-0.074950172
0.542327198	0.159921689	-0.07443069
0.543567608	0.158258796	-0.073885929
0.544739085	0.156375312	-0.073457405
0.54559155	0.155687222	-0.073190215
0.546420442	0.156622733	-0.072967927
0.547123749	0.15888171	-0.07280934
0.548127688	0.160683182	-0.072629319
0.548977826	0.162031731	-0.07242937
0.54974736	0.16248325	-0.072318842
0.550472238	0.16211005	-0.072181976
0.551212278	0.161628604	-0.072086211
0.55255792	0.161154058	-0.071700638
0.554213751	0.161144298	-0.071044317
0.555668031	0.161303531	-0.070554928
0.55700562	0.161284459	-0.070059108
0.557533079	0.162291275	-0.069923571
0.557419221	0.161899295	-0.069997435
0.557600507	0.160444664	-0.069938267
0.55793329	0.156845413	-0.069769683
0.559022693	0.151426546	-0.069284018
0.560533722	0.144916017	-0.06852008
0.562489579	0.137882095	-0.067531565
0.56442114	0.131476846	-0.066490178
0.56595802	0.125993651	-0.065615859
0.567052819	0.122519845	-0.064981615
0.567219809	0.12103451	-0.064800206
0.566675934	0.120207781	-0.064945658
0.565193903	0.12028865	-0.065516316
0.563449215	0.120084329	-0.066187065
0.561388691	0.121353758	-0.067033858
0.559706026	0.122346662	-0.067673558
0.557840624	0.122971031	-0.068438156
0.556079994	0.12387958	-0.069182449
0.554199641	0.125336108	-0.070019693
0.552188873	0.126375147	-0.07090632
0.549889437	0.128517991	-0.072036298
0.547747606	0.131798869	-0.073004879

**APPENDIX 3.5 – EXPERIMENTAL
RESULTS FROM UNIVERSITY OF GLASGOW**



C_N	C_A	C_M
0.545270281	0.136292862	-0.074191721
0.542602073	0.141042957	-0.075474786
0.539736447	0.14550579	-0.076840833
0.537090749	0.149820161	-0.078095292
0.535195218	0.153895931	-0.079035666
0.534365337	0.157535796	-0.07940455
0.533931454	0.160685661	-0.079426417
0.534097975	0.163074509	-0.079226215
0.534437198	0.164480739	-0.079069171
0.534918467	0.163650367	-0.078872747
0.535656468	0.160431786	-0.07854636
0.536711045	0.154743125	-0.078141391
0.538119717	0.147076417	-0.077557706
0.539637666	0.138517724	-0.07695184
0.541256182	0.12926644	-0.076213951
0.542970055	0.120826336	-0.075428374
0.54483204	0.113492595	-0.074633576
0.546435486	0.11009196	-0.073888186
0.547687708	0.109352462	-0.073336607
0.548929862	0.111519675	-0.072774092
0.550437467	0.1159698	-0.072126633
0.551844198	0.122544876	-0.071530311
0.552982926	0.129635225	-0.07103678
0.554150523	0.137124032	-0.070528597
0.555096618	0.142272123	-0.070213679
0.556240439	0.146228956	-0.069814894
0.557717821	0.148028407	-0.0691982
0.559699701	0.148872173	-0.068309901
0.561719029	0.148250089	-0.067418331
0.563939295	0.147435247	-0.06635958
0.566011213	0.145305398	-0.065407915
0.5676085	0.142984056	-0.064598204
0.568735278	0.140814828	-0.064042679
0.568897375	0.139162953	-0.063941997
0.568742479	0.137914322	-0.064001639
0.568289369	0.137844562	-0.06417957
0.567851633	0.138868021	-0.064398864
0.567084467	0.141074682	-0.064752266
0.56586586	0.144199235	-0.065317496
0.564141512	0.147324072	-0.066138297
0.56209787	0.150901385	-0.067218108
0.559867806	0.154698454	-0.068310623

C_N	C_A	C_M
0.557878885	0.157017653	-0.069232528
0.556031165	0.158111269	-0.070018025
0.554378442	0.158476159	-0.070803089
0.552563145	0.159371476	-0.071654367
0.550732507	0.159638109	-0.072562303
0.548440222	0.159339944	-0.073638441
0.546585009	0.158636561	-0.074477403
0.545201856	0.157710369	-0.075159332
0.544078641	0.157065963	-0.075742345
0.543242242	0.156952203	-0.07618065
0.542580939	0.156861261	-0.076579279
0.541893964	0.156239102	-0.077006886
0.541379076	0.155367011	-0.07738018
0.540831977	0.155768656	-0.077688068
0.540201821	0.155785938	-0.078070392
0.539501644	0.155198077	-0.078373652
0.538341668	0.154100019	-0.078957807
0.537025557	0.152735915	-0.07962089
0.535803209	0.150430804	-0.08022029
0.535066153	0.148155261	-0.0806073
0.534854729	0.145129932	-0.080778087
0.534983001	0.141039287	-0.080744869
0.535479469	0.137466763	-0.080493235
0.536404046	0.134322776	-0.080074354
0.537544264	0.132360571	-0.07953039
0.538979284	0.13179727	-0.078967941
0.540641504	0.132967374	-0.078307346
0.542037732	0.136990416	-0.077667264
0.543039007	0.142641493	-0.077291918
0.543559384	0.149420179	-0.077061488
0.543808571	0.157012081	-0.077016797
0.543959925	0.164667384	-0.076923359
0.544166546	0.17284084	-0.076785545
0.54460499	0.179433918	-0.076546916
0.544975782	0.183092244	-0.076309639
0.54565241	0.185048491	-0.07596653
0.546564716	0.184568641	-0.075438647
0.547643143	0.181218159	-0.074924259
0.548965623	0.177314941	-0.074253854
0.549867247	0.171543317	-0.073763371
0.55055402	0.166190946	-0.073398147
0.551040017	0.161223013	-0.073102001

**APPENDIX 3.5 – EXPERIMENTAL
RESULTS FROM UNIVERSITY OF GLASGOW**



C_N	C_A	C_M
0.551797434	0.157227272	-0.072734048
0.552451476	0.154948861	-0.072402289
0.553337043	0.155879392	-0.072002701
0.554349361	0.159292189	-0.07145801
0.555283102	0.164597011	-0.071018257
0.556275045	0.171435165	-0.070435498
0.55716193	0.178451522	-0.069971214
0.557552366	0.185436827	-0.069692667
0.55713614	0.190592076	-0.069854407
0.556123028	0.193495346	-0.070317589
0.554974094	0.194521997	-0.070816527
0.554091107	0.192244306	-0.071197207
0.553327631	0.190357236	-0.071501213
0.552156168	0.187139341	-0.072011206
0.550663293	0.184045509	-0.072667301
0.549187842	0.180446726	-0.073363411
0.54795468	0.177892289	-0.073904785
0.546807029	0.176262159	-0.074386674
0.545676829	0.175191794	-0.074908878
0.544644289	0.174474176	-0.075300206
0.54371192	0.173105652	-0.075657156
0.543348465	0.171458	-0.075710485
0.542993931	0.169425012	-0.075791576
0.542250714	0.166584901	-0.07605238
0.541322761	0.163073463	-0.076422315
0.540324206	0.159342718	-0.076713245
0.539587304	0.156729249	-0.077002032
0.539075338	0.154324743	-0.077095414
0.538730464	0.152996418	-0.077136971
0.538317633	0.151798478	-0.077196802
0.537971444	0.152203579	-0.077239507
0.537762067	0.153831484	-0.077246089
0.537718335	0.157163504	-0.077120175
0.537655325	0.161321086	-0.077037085
0.537541501	0.166171419	-0.077012746
0.537498699	0.170723542	-0.076887221
0.538046443	0.174512812	-0.076512469
0.538903799	0.176696186	-0.075948675
0.539832946	0.17609845	-0.075364413
0.540768637	0.173507288	-0.074776719
0.541983794	0.167765865	-0.074112544
0.543850487	0.160788423	-0.07306991

C_N	C_A	C_M
0.545782649	0.151818223	-0.071993826
0.548170205	0.141391266	-0.070703885
0.550447266	0.131072998	-0.069436816
0.552898197	0.122365038	-0.068130889
0.555234084	0.115392809	-0.066931719
0.557005306	0.111485558	-0.066050624
0.558488891	0.109851923	-0.065331378
0.559768766	0.110467565	-0.064683005
0.561144135	0.112813914	-0.063986897
0.56240954	0.117150169	-0.063314307
0.563630235	0.122445187	-0.062713574
0.564244933	0.129601541	-0.062419215
0.564284097	0.135563108	-0.062399287
0.564027158	0.140973806	-0.062496203
0.563701819	0.145433897	-0.062595128
0.563707231	0.147916934	-0.062559178
0.563896588	0.149507843	-0.062495484
0.563947124	0.148891088	-0.062355018
0.563887392	0.147820368	-0.062400845
0.563332079	0.145389159	-0.062631737
0.562355515	0.14254841	-0.063042991
0.561085141	0.139493635	-0.063668204
0.55993562	0.138161483	-0.064216558
0.55911565	0.137875961	-0.064549848
0.55877338	0.139058061	-0.064642402
0.5586836	0.142452738	-0.064526078
0.559012271	0.146975933	-0.064312736
0.559334115	0.151488062	-0.064086461
0.559592319	0.155937075	-0.063794378
0.55974691	0.159225764	-0.063619628
0.560067066	0.161325539	-0.063377268
0.56009839	0.163277042	-0.063264441
0.559950477	0.164181226	-0.063274444
0.55964862	0.16468693	-0.063378201
0.559082329	0.165425719	-0.063582679
0.558179664	0.165166515	-0.064087097
0.556921169	0.16528923	-0.064754797
0.555450778	0.165301937	-0.065562179
0.554114142	0.165226764	-0.066139006
0.552789001	0.165494474	-0.066840538
0.551488185	0.164956151	-0.067497369

