LSNReviews

From: James Prikryl
Sent: Thursday, April 08, 2004 4:06 PM
To: 'Don Bannon'
Subject: slope and intercept calculation
Attachments: regression_feb2003.xls

Don,

Attached is a file you can use to calculate correction values for the thermocouples.

Jim

Properties Page

Return-path: <ajain@cnwra.swri.edu>
Received: from stu2571 ([129.162.200.105])
 by rogain.cnwra.swri.edu (Sun ONE Messaging Server 6.0 (built Oct 29 2003))
 with ESMTP id <0J3F004IEEYOUW60@rogain.cnwra.swri.edu> for
 dbannon@cnwra.swri.edu; Thu, 03 Aug 2006 09:30:26 -0500 (CDT)
Date: Thu, 03 Aug 2006 09:30:24 -0500
From: Alka Jain <ajain@cnwra.swri.edu>
Subject:
To: Don Bannon <dbannon@cnwra.swri.edu>
Reply-to: ajain@cnwra.swri.edu
Message-id: <000001c6b709$5b8e5100$69c8a281@cnwra.swri.edu>
Organization: CNWRA
MIME-version: 1.0
X-MIMEOLE: Produced By Microsoft MimeOLE V6.00.2900.2670
X-Mailer: Microsoft Outlook, Build 10.0.6626
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Importance: Normal
X-Priority: 3 (Normal)
X-MSMail-priority: Normal
Original-recipient: rfc822;dbannon@cnwra.swri.edu
Microsoft Mail Internet Headers Version 2.0
Received: from viruswall.ccf.swri.edu ([129.162.252.34]) by
adsms01.dyn.datasys.swri.edu with Microsoft SMTPSVC(5.0.2195.6713);
 Fri, 16 Apr 2004 10:20:56 -0500
Received: from bams (localhost [127.0.0.1])
 by viruswall.ccf.swri.edu (8.12.10/8.12.6) with ESMTP id i3GFKrdB017398
 for <DBannon@datasys.swri.edu>; Fri, 16 Apr 2004 10:20:53 -0500 (CDT)
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 by bams.ccf.swri.edu
 (iPlanet Messaging Server 5.2 HotFix 1.17 (built Jun 23 2003))
 with ESMTP id <0HW900C1LRYRPR@bams.ccf.swri.edu> for
DBannon@datasys.swri.edu
 (ORCPT don.bannon@swri.org); Fri, 16 Apr 2004 10:20:52 -0500 (CDT)
Received: from svedeman2k (localhost [127.0.0.1]) by viruswall.ccf.swri.edu
 (8.12.10/8.12.6) with SMTP id i3GFKmdB017390; Fri,
 16 Apr 2004 10:20:48 -0500 (CDT)
Date: Fri, 16 Apr 2004 10:25:27 -0500
From: Steve Svedeman <steven.svedeman@swri.org>
Subject: Temperature Sensor Calibration
To: Randall W Fedors <randall.fedors@swri.org>, david.farrell@swri.org
Cc: Don Bannon <don.bannon@swri.org>
Reply-to: steven.svedeman@swri.org
Message-id: <MOENJFAIHIJDCIEHMOIGGEPACBAA.ssvedeman@swri.org>
MIME-version: 1.0
X-MIMEOLE: Produced By Microsoft MimeOLE V6.00.2800.1106
X-Mailer: Microsoft Outlook IMO, Build 9.0.2416 (9.0.2911.0)

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Importance: Normal
X-Priority: 3 (Normal)
X-MSMail-priority: Normal
Return-Path: steven.svedeman@swri.org
X-OriginalArrivalTime: 16 Apr 2004 15:20:56.0236 (UTC)
FILETIME=[6A03FEC0:01C423C6]

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adsms01.dyn.datasys.swri.edu with Microsoft SMTPSVC(5.0.2195.6713);
Thu, 8 Apr 2004 15:03:59 -0500
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by viruswall.ccf.swri.edu (8.12.10/8.12.6) with ESMTP id i38K3wdB016846
for <DBannon@datasys.swri.edu>; Thu, 8 Apr 2004 15:03:58 -0500 (CDT)
Received: from rogain.cnwra.swri.edu
(trapdoor.cnwra.swri.edu [129.162.209.254]) by bams.ccf.swri.edu
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with ESMTP id <0HVV00LPIBQMBR@bams.ccf.swri.edu> for
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(ORCPT dbannon@swri.org); Thu, 08 Apr 2004 15:03:58 -0500 (CDT)
Received: from WYVERN (wyvern.cnwra.swri.edu [129.162.200.32])
by rogain.cnwra.swri.edu (iPlanet Messaging Server 5.2 (built Feb 21 2002))
with ESMTP id <0HVV008GVBQKGW@rogain.cnwra.swri.edu> for dbannon@swri.org;
Thu, 08 Apr 2004 15:03:58 -0500 (CDT)
Date: Thu, 08 Apr 2004 15:06:23 -0500
From: JPrikryl <jprikryl@cnwra.swri.edu>
Subject: slope and intercept calculation
To: "'Don Bannon'" <don.bannon@swri.org>
Message-id: <000701c41da4$f834fa00$20c8a281@WYVERN>
MIME-version: 1.0
X-MIMEOLE: Produced By Microsoft MimeOLE V6.00.2800.1165
X-Mailer: Microsoft Outlook 8.5, Build 4.71.2173.0
Content-type: multipart/mixed; boundary="Boundary_(ID_jay2mO0qnK50YH4uO4xFrw)"
Importance: Normal
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Content-transfer-encoding: 7BIT

--Boundary_(ID_+Perpvf6pcpugMxnM7DgFg)--
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--Boundary_(ID_jay2mO0qnK50YH4uO4xFrw)--

Thermometer reading °C	23.9	26.95	32.45	38.25	46.8	52.85

Thermocouple no.	Thermocouple readings °C					
1	22.20	25.20	30.70	36.57	44.95	51.46
2	22.41	25.44	30.92	36.79	45.22	51.63
3	22.29	25.30	30.78	36.65	45.08	51.49
4	22.48	25.50	31.00	36.88	45.34	51.79
5	22.47	25.45	30.95	36.80	45.20	51.60
6	22.43	25.42	30.88	36.72	45.13	51.51
7	22.74	25.78	31.29	37.17	45.63	52.03
8	22.71	25.73	31.18	37.02	45.39	51.84
9	22.73	25.76	31.26	37.15	45.55	52.07
10	22.82	25.86	31.34	37.23	45.68	52.05
11	22.74	25.74	31.22	37.05	45.47	51.84
12	22.87	25.90	31.38	37.25	45.68	52.12
13	22.87	25.86	31.33	37.17	45.54	52.00
14	22.88	25.87	31.35	37.21	45.62	52.04
15	22.85	25.85	31.33	37.15	45.56	51.93
16	22.65	25.63	31.08	36.93	45.37	51.69
17	22.67	25.65	31.13	37.00	45.40	51.68
18	22.64	25.63	31.08	36.97	45.40	51.87
19	22.62	25.60	31.04	36.90	45.27	51.70
20	22.54	25.52	30.96	36.85	45.27	51.63
21	22.23	25.24	30.76	36.67	45.10	51.62
22	22.30	25.30	30.74	36.65	45.02	51.44
23	22.31	25.31	30.79	36.68	45.15	51.57
24	22.41	25.41	30.90	36.77	45.19	51.61
25	22.51	25.51	31.00	36.83	45.22	51.62
26	22.54	25.53	30.98	36.83	45.24	51.53
27	22.70	25.71	31.18	37.03	45.42	51.84
28	22.72	25.72	31.23	37.08	45.52	51.94
29	22.72	25.74	31.17	37.05	45.45	51.86
30	22.70	25.72	31.18	37.04	45.44	51.80
31	22.77	25.77	31.19	37.03	45.39	51.66
32	22.79	25.79	31.26	37.16	45.60	51.79
33	22.80	25.79	31.27	37.12	45.53	51.90
34	22.78	25.75	31.22	37.09	45.48	51.87
35	22.76	25.76	31.19	37.06	45.43	51.76
36	22.65	25.65	31.11	36.96	45.37	51.83
37	22.67	25.65	31.07	36.95	45.33	51.67
38	22.64	25.60	31.06	36.90	45.31	51.54
39	22.59	25.56	31.02	36.87	45.31	51.68
40	22.50	25.47	30.92	36.75	45.12	51.58
41	22.58	25.56	30.98	36.85	45.19	51.59
42	22.68	25.66	31.11	37.00	45.40	51.83
43	22.52	25.47	30.90	36.76	45.11	51.51
44	22.66	25.64	31.08	36.93	45.34	51.69
45	22.62	25.60	31.05	36.88	45.29	51.66
46	22.57	25.53	30.96	36.81	45.20	51.58

47	22.87	25.87	31.29	37.14	45.55	51.91
48	22.82	25.79	31.24	37.10	45.50	51.87
49	22.88	25.87	31.31	37.15	45.57	51.93
50	22.90	25.90	31.35	37.21	45.63	52.01
51	22.86	25.84	31.32	37.19	45.65	52.09
52	23.02	25.97	31.37	37.20	45.54	51.89
53	22.98	25.96	31.37	37.22	45.61	52.06
54	22.95	25.92	31.36	37.19	45.55	51.97
55	22.91	25.90	31.34	37.21	45.65	52.03
56	22.76	25.72	31.16	37.01	45.40	51.76
57	22.78	25.72	31.16	37.01	45.41	51.74
58	22.84	25.81	31.26	37.13	45.57	51.96
59	22.76	25.73	31.18	37.04	45.49	51.86
60	22.71	25.68	31.12	36.96	45.39	51.75
61	22.57	25.54	30.99	36.84	45.22	51.63
62	22.55	25.52	30.97	36.84	45.21	51.61
63	22.53	25.47	30.88	36.72	45.06	51.40
64	22.57	25.54	30.99	36.85	45.19	51.57
65	22.59	25.58	31.03	36.92	45.30	51.68
66	22.69	25.65	31.10	36.96	45.31	51.69
67	22.80	25.78	31.22	37.06	45.40	51.81
68	22.80	25.79	31.22	37.06	45.42	51.81
69	22.88	25.85	31.30	37.17	45.51	51.93
70	22.81	25.81	31.26	37.13	45.52	51.93
71	22.90	25.86	31.28	37.11	45.42	51.75
72	22.93	25.90	31.35	37.18	45.54	51.93
73	22.94	25.91	31.36	37.20	45.66	51.99
74	22.91	25.87	31.32	37.20	45.55	52.03
75	22.83	25.80	31.21	37.04	45.42	51.80
76	22.73	25.68	31.10	36.94	45.31	51.67
77	22.80	25.75	31.21	37.10	45.46	51.90
78	22.74	25.70	31.17	37.06	45.45	51.87
79	22.70	25.66	31.11	37.01	45.42	51.90
80	22.66	25.62	31.08	36.96	45.35	51.80
81	24.61	27.55	33.04	38.83	47.23	53.76
82	24.55	27.52	33.03	38.86	47.29	53.73
83	24.40	27.32	32.80	38.63	47.01	53.58
84	24.31	27.24	32.74	38.57	46.98	53.51
85	24.22	27.16	32.66	38.48	46.91	53.45
86	24.11	27.04	32.52	38.35	46.80	53.29
87	24.13	27.11	32.59	38.47	46.91	53.40
88	24.19	27.16	32.66	38.47	46.97	53.46
89	24.12	27.08	32.56	38.42	46.91	53.41
90	24.01	26.98	32.47	38.33	46.80	53.31
91	24.23	27.17	32.63	38.46	46.92	53.40
92	24.20	27.17	32.64	38.51	46.94	53.39
93	24.13	27.09	32.53	38.36	46.83	53.30
94	24.08	27.04	32.51	38.37	46.82	53.30
95	23.84	26.79	32.24	38.11	46.58	53.05
96	24.02	26.99	32.43	38.27	46.71	53.20
97	24.08	27.00	32.45	38.32	46.74	53.23
98	24.14	27.08	32.54	38.38	46.77	53.30

99	24.07	27.02	32.47	38.33	46.75	53.29
100	24.10	27.03	32.46	38.32	46.75	53.25
101	24.56	27.49	33.01	38.79	47.21	53.68
102	24.45	27.39	32.92	38.72	47.14	53.64
103	24.34	27.28	32.76	38.56	46.97	53.53
104	24.25	27.17	32.67	38.48	46.89	53.39
105	24.08	27.04	32.55	38.39	46.78	53.34
106	24.11	27.04	32.53	38.35	46.82	53.32
107	24.16	27.14	32.62	38.47	46.95	53.39
108	24.16	27.10	32.57	38.41	46.86	53.33
109	24.08	27.03	32.50	38.37	46.86	53.35
110	23.92	26.89	32.40	38.25	46.75	53.18
111	24.20	27.14	32.61	38.47	46.92	53.38
112	24.13	27.09	32.54	38.40	46.86	53.35
113	24.10	27.05	32.49	38.35	46.78	53.28
114	23.95	26.90	32.36	38.22	46.68	53.20
115	23.81	26.77	32.23	38.09	46.54	53.09
116	24.06	27.00	32.46	38.30	46.75	53.26
117	24.11	27.04	32.51	38.32	46.77	53.25
118	24.10	27.05	32.51	38.38	46.85	53.35
119	24.08	27.02	32.48	38.33	46.76	53.31
120	24.05	26.99	32.46	38.30	46.74	53.27

Regression coefficients

Thermocouple No.	b	a
1	1.9189	0.9934
2	1.6793	0.9939
3	1.7991	0.9944
4	1.6856	0.9910
5	1.5733	0.9967
6	1.5763	0.9983
7	1.3980	0.9915
8	1.2945	0.9979
9	1.4373	0.9909
10	1.2830	0.9932
11	1.2719	0.9977
12	1.2418	0.9933
13	1.1526	0.9977
14	1.1862	0.9959
15	1.1437	0.9985
16	1.3548	0.9987
17	1.3072	0.9992
18	1.4934	0.9936
19	1.3837	0.9989
20	1.5025	0.9973
21	2.0021	0.9885
22	1.7489	0.9965
23	1.8497	0.9919
24	1.6810	0.9944
25	1.4906	0.9979
26	1.4058	1.0006
27	1.3248	0.9971
28	1.3944	0.9936
29	1.3281	0.9965
30	1.3106	0.9975
31	1.0858	1.0041
32	1.1804	0.9987
33	1.2216	0.9975
34	1.2506	0.9977
35	1.1782	1.0008
36	1.4302	0.9956
37	1.2951	1.0004
38	1.2599	1.0027
39	1.4597	0.9973
40	1.5077	0.9992
41	1.3659	1.0012
42	1.3954	0.9960
43	1.4507	1.0010
44	1.3223	0.9997
45	1.3717	0.9994
46	1.4104	1.0004
47	1.1060	0.9997
48	1.1866	0.9989
49	1.1180	0.9990

50	1.1293	0.9973
51	1.2920	0.9930
52	0.8462	1.0052
53	1.0391	0.9989
54	1.0184	1.0007
55	1.1596	0.9963
56	1.2100	1.0006
57	1.1826	1.0014
58	1.2347	0.9964
59	1.2940	0.9971
60	1.2940	0.9992
61	1.4316	0.9992
62	1.4612	0.9987
63	1.3543	1.0048
64	1.3842	1.0009
65	1.4336	0.9977
66	1.2770	1.0007
67	1.1465	1.0012
68	1.1453	1.0010
69	1.1165	0.9994
70	1.2235	0.9972
71	0.9328	1.0060
72	1.0130	1.0014
73	1.0876	0.9982
74	1.1403	0.9976
75	1.1131	1.0020
76	1.2029	1.0026
77	1.2431	0.9978
78	1.3388	0.9962
79	1.4393	0.9942
80	1.4205	0.9962
81	-0.5268	0.9971
82	-0.4453	0.9951
83	-0.2645	0.9958
84	-0.1684	0.9948
85	-0.0465	0.9937
86	0.0430	0.9947
87	0.0588	0.9921
88	0.0142	0.9920
89	0.1111	0.9912
90	0.2160	0.9911
91	-0.0888	0.9951
92	-0.0697	0.9945
93	-0.0088	0.9955
94	0.0862	0.9935
95	0.3339	0.9936
96	0.1015	0.9954
97	0.0684	0.9953
98	-0.0303	0.9963
99	0.0996	0.9940
100	0.0423	0.9957
101	-0.4800	0.9971

102	-0.3234	0.9950
103	-0.2144	0.9957
104	-0.1483	0.9965
105	0.0834	0.9933
106	0.0655	0.9939
107	0.0109	0.9929
108	-0.0230	0.9951
109	0.1523	0.9915
110	0.2721	0.9918
111	-0.0544	0.9947
112	0.0390	0.9937
113	0.0459	0.9949
114	0.2543	0.9926
115	0.3954	0.9923
116	0.1065	0.9943
117	0.0063	0.9962
118	0.1073	0.9925
119	0.1049	0.9936
120	0.1216	0.9940

Calculation of regression values used to correct themocouple readings for coldtrap experiment.

Conducted on November 19, 2002

Thermocouple check	Thermocouple no. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Thermometer reading oC																				
23.9	22.20	22.41	22.29	22.48	22.47	22.43	22.74	22.71	22.73	22.82	22.74	22.87	22.87	22.88	22.85	22.65	22.67	22.64	22.62	22.54
26.95	25.20	25.44	25.30	25.50	25.45	25.42	25.78	25.73	25.76	25.86	25.74	25.90	25.86	25.87	25.85	25.63	25.65	25.63	25.60	25.52
32.45	30.70	30.92	30.78	31.00	30.95	30.88	31.29	31.18	31.26	31.34	31.22	31.38	31.33	31.35	31.33	31.08	31.13	31.08	31.04	30.96
38.25	36.57	36.79	36.65	36.88	36.80	36.72	37.17	37.02	37.15	37.23	37.05	37.25	37.17	37.21	37.15	36.93	37.00	36.97	36.90	36.85
46.8	44.95	45.22	45.08	45.34	45.20	45.13	45.63	45.39	45.55	45.68	45.47	45.68	45.54	45.62	45.56	45.37	45.40	45.40	45.27	45.27
52.85	51.46	51.63	51.49	51.79	51.60	51.51	52.03	51.84	52.07	52.05	51.84	52.12	52.00	52.04	51.93	51.69	51.68	51.87	51.70	51.63
Intercept	1.9189	1.6793	1.7991	1.6856	1.5733	1.5763	1.3980	1.2945	1.4373	1.2830	1.2719	1.2418	1.1526	1.1862	1.1437	1.3548	1.3072	1.4934	1.3837	1.5025
Slope	0.9934	0.9939	0.9944	0.9910	0.9967	0.9983	0.9915	0.9979	0.9909	0.9932	0.9977	0.9933	0.9977	0.9959	0.9985	0.9987	0.9992	0.9936	0.9989	0.9973

Thermometer reading °C	23.9	26.95	32.45	38.25	46.8	52.85
Thermocouple No.	Thermocouple readings °C					
1	22.20	25.20	30.70	36.57	44.95	51.46
2	22.41	25.44	30.92	36.79	45.22	51.63
3	22.29	25.30	30.78	36.65	45.08	51.49
4	22.48	25.50	31.00	36.88	45.34	51.79
5	22.47	25.45	30.95	36.80	45.20	51.60
6	22.43	25.42	30.88	36.72	45.13	51.51
7	22.74	25.78	31.29	37.17	45.63	52.03
8	22.71	25.73	31.18	37.02	45.39	51.84
9	22.73	25.76	31.26	37.15	45.55	52.07
10	22.82	25.86	31.34	37.23	45.68	52.05
11	22.74	25.74	31.22	37.05	45.47	51.84
12	22.87	25.90	31.38	37.25	45.68	52.12
13	22.87	25.86	31.33	37.17	45.54	52.00
14	22.88	25.87	31.35	37.21	45.62	52.04
15	22.85	25.85	31.33	37.15	45.56	51.93
16	22.65	25.63	31.08	36.93	45.37	51.69
17	22.67	25.65	31.13	37.00	45.40	51.68
18	22.64	25.63	31.08	36.97	45.40	51.87
19	22.62	25.60	31.04	36.90	45.27	51.70
20	22.54	25.52	30.96	36.85	45.27	51.63
21	22.23	25.24	30.76	36.67	45.10	51.62
22	22.30	25.30	30.74	36.65	45.02	51.44
23	22.31	25.31	30.79	36.68	45.15	51.57
24	22.41	25.41	30.90	36.77	45.19	51.61
25	22.51	25.51	31.00	36.83	45.22	51.62
26	22.54	25.53	30.98	36.83	45.24	51.53
27	22.70	25.71	31.18	37.03	45.42	51.84
28	22.72	25.72	31.23	37.08	45.52	51.94
29	22.72	25.74	31.17	37.05	45.45	51.86
30	22.70	25.72	31.18	37.04	45.44	51.80
31	22.77	25.77	31.19	37.03	45.39	51.66
32	22.79	25.79	31.26	37.16	45.60	51.79
33	22.80	25.79	31.27	37.12	45.53	51.90
34	22.78	25.75	31.22	37.09	45.48	51.87
35	22.76	25.76	31.19	37.06	45.43	51.76
36	22.65	25.65	31.11	36.96	45.37	51.83
37	22.67	25.65	31.07	36.95	45.33	51.67
38	22.64	25.60	31.06	36.90	45.31	51.54
39	22.59	25.56	31.02	36.87	45.31	51.68
40	22.50	25.47	30.92	36.75	45.12	51.58
41	22.58	25.56	30.98	36.85	45.19	51.59
42	22.68	25.66	31.11	37.00	45.40	51.83
43	22.52	25.47	30.90	36.76	45.11	51.51
44	22.66	25.64	31.08	36.93	45.34	51.69
45	22.62	25.60	31.05	36.88	45.29	51.66
46	22.57	25.53	30.96	36.81	45.20	51.58
47	22.87	25.87	31.29	37.14	45.55	51.91
48	22.82	25.79	31.24	37.10	45.50	51.87

49	22.88	25.87	31.31	37.15	45.57	51.93
50	22.90	25.90	31.35	37.21	45.63	52.01
51	22.86	25.84	31.32	37.19	45.65	52.09
52	23.02	25.97	31.37	37.20	45.54	51.89
53	22.98	25.96	31.37	37.22	45.61	52.06
54	22.95	25.92	31.36	37.19	45.55	51.97
55	22.91	25.90	31.34	37.21	45.65	52.03
56	22.76	25.72	31.16	37.01	45.40	51.76
57	22.78	25.72	31.16	37.01	45.41	51.74
58	22.84	25.81	31.26	37.13	45.57	51.96
59	22.76	25.73	31.18	37.04	45.49	51.86
60	22.71	25.68	31.12	36.96	45.39	51.75
61	22.57	25.54	30.99	36.84	45.22	51.63
62	22.55	25.52	30.97	36.84	45.21	51.61
63	22.53	25.47	30.88	36.72	45.06	51.40
64	22.57	25.54	30.99	36.85	45.19	51.57
65	22.59	25.58	31.03	36.92	45.30	51.68
66	22.69	25.65	31.10	36.96	45.31	51.69
67	22.80	25.78	31.22	37.06	45.40	51.81
68	22.80	25.79	31.22	37.06	45.42	51.81
69	22.88	25.85	31.30	37.17	45.51	51.93
70	22.81	25.81	31.26	37.13	45.52	51.93
71	22.90	25.86	31.28	37.11	45.42	51.75
72	22.93	25.90	31.35	37.18	45.54	51.93
73	22.94	25.91	31.36	37.20	45.66	51.99
74	22.91	25.87	31.32	37.20	45.55	52.03
75	22.83	25.80	31.21	37.04	45.42	51.80
76	22.73	25.68	31.10	36.94	45.31	51.67
77	22.80	25.75	31.21	37.10	45.46	51.90
78	22.74	25.70	31.17	37.06	45.45	51.87
79	22.70	25.66	31.11	37.01	45.42	51.90
80	22.66	25.62	31.08	36.96	45.35	51.80
81	24.61	27.55	33.04	38.83	47.23	53.76
82	24.55	27.52	33.03	38.86	47.29	53.73
83	24.40	27.32	32.80	38.63	47.01	53.58
84	24.31	27.24	32.74	38.57	46.98	53.51
85	24.22	27.16	32.66	38.48	46.91	53.45
86	24.11	27.04	32.52	38.35	46.80	53.29
87	24.13	27.11	32.59	38.47	46.91	53.40
88	24.19	27.16	32.66	38.47	46.97	53.46
89	24.12	27.08	32.56	38.42	46.91	53.41
90	24.01	26.98	32.47	38.33	46.80	53.31
91	24.23	27.17	32.63	38.46	46.92	53.40
92	24.20	27.17	32.64	38.51	46.94	53.39
93	24.13	27.09	32.53	38.36	46.83	53.30
94	24.08	27.04	32.51	38.37	46.82	53.30
95	23.84	26.79	32.24	38.11	46.58	53.05
96	24.02	26.99	32.43	38.27	46.71	53.20
97	24.08	27.00	32.45	38.32	46.74	53.23
98	24.14	27.08	32.54	38.38	46.77	53.30
99	24.07	27.02	32.47	38.33	46.75	53.29
100	24.10	27.03	32.46	38.32	46.75	53.25
101	24.56	27.49	33.01	38.79	47.21	53.68
102	24.45	27.39	32.92	38.72	47.14	53.64
103	24.34	27.28	32.76	38.56	46.97	53.53
104	24.25	27.17	32.67	38.48	46.89	53.39
105	24.08	27.04	32.55	38.39	46.78	53.34
106	24.11	27.04	32.53	38.35	46.82	53.32
107	24.16	27.14	32.62	38.47	46.95	53.39
108	24.16	27.10	32.57	38.41	46.86	53.33
109	24.08	27.03	32.50	38.37	46.86	53.35
110	23.92	26.89	32.40	38.25	46.75	53.18
111	24.20	27.14	32.61	38.47	46.92	53.38
112	24.13	27.09	32.54	38.40	46.86	53.35
113	24.10	27.05	32.49	38.35	46.78	53.28
114	23.95	26.90	32.36	38.22	46.68	53.20
115	23.81	26.77	32.23	38.09	46.54	53.09
116	24.06	27.00	32.46	38.30	46.75	53.26
117	24.11	27.04	32.51	38.32	46.77	53.25
118	24.10	27.05	32.51	38.38	46.85	53.35
119	24.08	27.02	32.48	38.33	46.76	53.31
120	24.05	26.99	32.46	38.30	46.74	53.27

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
22.23	22.30	22.31	22.41	22.51	22.54	22.70	22.72	22.72	22.70	22.77	22.79	22.80	22.78	22.76	22.65	22.67	22.64	22.59	22.50	22.58	22.68	22.52	22.66
25.24	25.30	25.31	25.41	25.51	25.53	25.71	25.72	25.74	25.72	25.77	25.79	25.79	25.75	25.76	25.65	25.65	25.60	25.56	25.47	25.56	25.66	25.47	25.64
30.76	30.74	30.79	30.90	31.00	30.98	31.18	31.23	31.17	31.18	31.19	31.26	31.27	31.22	31.19	31.11	31.07	31.06	31.02	30.92	30.98	31.11	30.90	31.08
36.67	36.65	36.68	36.77	36.83	36.83	37.03	37.08	37.05	37.04	37.03	37.16	37.12	37.09	37.06	36.96	36.95	36.90	36.87	36.75	36.85	37.00	36.76	36.93
45.10	45.02	45.15	45.19	45.22	45.24	45.42	45.52	45.45	45.44	45.39	45.60	45.53	45.48	45.43	45.37	45.33	45.31	45.31	45.12	45.19	45.40	45.11	45.34
51.62	51.44	51.57	51.61	51.62	51.53	51.84	51.94	51.86	51.80	51.66	51.79	51.90	51.87	51.76	51.83	51.67	51.54	51.68	51.58	51.59	51.83	51.51	51.69
2.0021	1.7489	1.8497	1.6810	1.4906	1.4058	1.3248	1.3944	1.3281	1.3106	1.0858	1.1804	1.2216	1.2506	1.1782	1.4302	1.2951	1.2599	1.4597	1.5077	1.3659	1.3954	1.4507	1.3223
0.9885	0.9965	0.9919	0.9944	0.9979	1.0006	0.9971	0.9936	0.9965	0.9975	1.0041	0.9987	0.9975	0.9977	1.0008	0.9956	1.0004	1.0027	0.9973	0.9992	1.0012	0.9960	1.0010	0.9997

45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67
22.62	22.57	22.87	22.82	22.88	22.90	22.86	23.02	22.98	22.95	22.91	22.76	22.78	22.84	22.76	22.71	22.57	22.55	22.53	22.57	22.59	22.69	22.80
25.60	25.53	25.87	25.79	25.87	25.90	25.84	25.97	25.96	25.92	25.90	25.72	25.72	25.81	25.73	25.68	25.54	25.52	25.47	25.54	25.58	25.65	25.78
31.05	30.96	31.29	31.24	31.31	31.35	31.32	31.37	31.37	31.36	31.34	31.16	31.16	31.26	31.18	31.12	30.99	30.97	30.88	30.99	31.03	31.10	31.22
36.88	36.81	37.14	37.10	37.15	37.21	37.19	37.20	37.22	37.19	37.21	37.01	37.01	37.13	37.04	36.96	36.84	36.84	36.72	36.85	36.92	36.96	37.06
45.29	45.20	45.55	45.50	45.57	45.63	45.65	45.54	45.61	45.55	45.65	45.40	45.41	45.57	45.49	45.39	45.22	45.21	45.06	45.19	45.30	45.31	45.40
51.66	51.58	51.91	51.87	51.93	52.01	52.09	51.89	52.06	51.97	52.03	51.76	51.74	51.96	51.86	51.75	51.63	51.61	51.40	51.57	51.68	51.69	51.81
1.3717	1.4104	1.1060	1.1866	1.1180	1.1293	1.2920	0.8462	1.0391	1.0184	1.1596	1.2100	1.1826	1.2347	1.2940	1.2940	1.4316	1.4612	1.3543	1.3842	1.4336	1.2770	1.1465
0.9994	1.0004	0.9997	0.9989	0.9990	0.9973	0.9930	1.0052	0.9989	1.0007	0.9963	1.0006	1.0014	0.9964	0.9971	0.9992	0.9992	0.9987	1.0048	1.0009	0.9977	1.0007	1.0012

68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91
22.80	22.88	22.81	22.90	22.93	22.94	22.91	22.83	22.73	22.80	22.74	22.70	22.66	24.61	24.55	24.40	24.31	24.22	24.11	24.13	24.19	24.12	24.01	24.23
25.79	25.85	25.81	25.86	25.90	25.91	25.87	25.80	25.68	25.75	25.70	25.66	25.62	27.55	27.52	27.32	27.24	27.16	27.04	27.11	27.16	27.08	26.98	27.17
31.22	31.30	31.26	31.28	31.35	31.36	31.32	31.21	31.10	31.21	31.17	31.11	31.08	33.04	33.03	32.80	32.74	32.66	32.52	32.59	32.66	32.56	32.47	32.63
37.06	37.17	37.13	37.11	37.18	37.20	37.20	37.04	36.94	37.10	37.06	37.01	36.96	38.83	38.86	38.63	38.57	38.48	38.35	38.47	38.47	38.42	38.33	38.46
45.42	45.51	45.52	45.42	45.54	45.66	45.55	45.42	45.31	45.46	45.45	45.42	45.35	47.23	47.29	47.01	46.98	46.91	46.80	46.91	46.97	46.91	46.80	46.92
51.81	51.93	51.93	51.75	51.93	51.99	52.03	51.80	51.67	51.90	51.87	51.90	51.80	53.76	53.73	53.58	53.51	53.45	53.29	53.40	53.46	53.41	53.31	53.40
1.1453	1.1165	1.2235	0.9328	1.0130	1.0876	1.1403	1.1131	1.2029	1.2431	1.3388	1.4393	1.4205	-0.5268	-0.4453	-0.2645	-0.1684	-0.0465	0.0430	0.0588	0.0142	0.1111	0.2160	-0.0888
1.0010	0.9994	0.9972	1.0060	1.0014	0.9982	0.9976	1.0020	1.0026	0.9978	0.9962	0.9942	0.9962	0.9971	0.9951	0.9958	0.9948	0.9937	0.9947	0.9921	0.9920	0.9912	0.9911	0.9951

92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115
24.20	24.13	24.08	23.84	24.02	24.08	24.14	24.07	24.10	24.56	24.45	24.34	24.25	24.08	24.11	24.16	24.16	24.08	23.92	24.20	24.13	24.10	23.95	23.81
27.17	27.09	27.04	26.79	26.99	27.00	27.08	27.02	27.03	27.49	27.39	27.28	27.17	27.04	27.04	27.14	27.10	27.03	26.89	27.14	27.09	27.05	26.90	26.77
32.64	32.53	32.51	32.24	32.43	32.45	32.54	32.47	32.46	33.01	32.92	32.76	32.67	32.55	32.53	32.62	32.57	32.50	32.40	32.61	32.54	32.49	32.36	32.23
38.51	38.36	38.37	38.11	38.27	38.32	38.38	38.33	38.32	38.79	38.72	38.56	38.48	38.39	38.35	38.47	38.41	38.37	38.25	38.47	38.40	38.35	38.22	38.09
46.94	46.83	46.82	46.58	46.71	46.74	46.77	46.75	46.75	47.21	47.14	46.97	46.89	46.78	46.82	46.95	46.86	46.86	46.75	46.92	46.86	46.78	46.68	46.54
53.39	53.30	53.30	53.05	53.20	53.23	53.30	53.29	53.25	53.68	53.64	53.53	53.39	53.34	53.32	53.39	53.33	53.35	53.18	53.38	53.35	53.28	53.20	53.09
-0.0697	-0.0088	0.0862	0.3339	0.1015	0.0684	-0.0303	0.0996	0.0423	-0.4800	-0.3234	-0.2144	-0.1483	0.0834	0.0655	0.0109	-0.0230	0.1523	0.2721	-0.0544	0.0390	0.0459	0.2543	0.3954
0.9945	0.9955	0.9935	0.9936	0.9954	0.9953	0.9963	0.9940	0.9957	0.9971	0.9950	0.9957	0.9965	0.9933	0.9939	0.9929	0.9951	0.9915	0.9918	0.9947	0.9937	0.9949	0.9926	0.9923

116	117	118	119	120
24.06	24.11	24.10	24.08	24.05
27.00	27.04	27.05	27.02	26.99
32.46	32.51	32.51	32.48	32.46
38.30	38.32	38.38	38.33	38.30
46.75	46.77	46.85	46.76	46.74
53.26	53.25	53.35	53.31	53.27
0.1065	0.0063	0.1073	0.1049	0.1216
0.9943	0.9962	0.9925	0.9936	0.9940