

Marangoni Experiment In Space series-3

[acronym]
 AR: Aspect Ratio (=Length/Dia.=L/D)
 C/O: check out
 CD: Cooling Disk
 Dia.: Diameter
 ΔT: Temperature difference between Cooling disk and Heating disk
 Exp.: Experiment
 GMT: Greenwich Mean Time
 H: Liquid Bridge Length [mm]
 HD: Heating Disk
 IR: Infrared (Infrared image)
 JST: Japan Standard Time (=GMT+9h)
 L/D: Length/Diameter (ratio of liquid bridge length to liquid bridge diameter)

[acronym]
 L/R: Length/Radius (ratio of liquid bridge length to liquid bridge radius)
 LB: Liquid Bridge
 MEIS3: Marangoni Experiment In Space series-3
 N/A: Not Applicable
 VR: Volume Ratio (=actual Liquid Bridge volume/straight Liquid Bridge volume)

[glossary]
 Corrected LB Length[mm]="CD posn" on telemetry data+"initial gap"
 initial gap: correction value of distance between disks
 cor: the folder name, the folder containing Data that recorded on the time zone
 which a communication line (Air to Ground) cannot establish
 real: the folder name, the folder containing "real time data".

[Information]

Correction value	surrounding gas
Corrected HD temperature = HD temperature of telemetry (ITO1) + 1.2[K]	Argon(95%)+Air(5%)

[Note for All MEIS-3 experiments]

IR image has some dark spots by dirt on optical path.(See Pic.-2)
 On and after MEIS3-17, the dark spots are decreasing by maintenance operation.

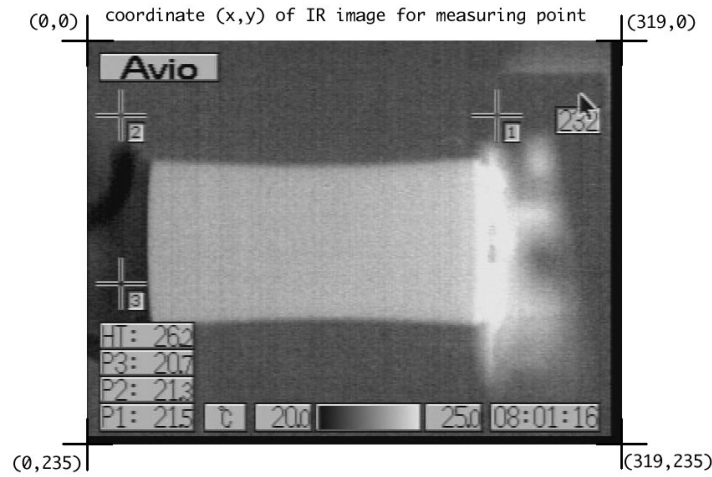
[Experiment sample]

	Material name	Manufacture	Model number, Character	amount	density @25 degre C [kg/m ³]	kinematic viscosity @25degree C [m ² /s]	temperature coefficient of surface tension [N/mK]	Thermal diffusivity [m ² /s]
Working fluid	silicone oil	Shin-Etsu Chemical Co., Ltd.	KF-96L-20CS	-	947.25	2.00E-05	-5.85E-05	9.67E-08
Dye	TNSB	KAWAJI lab, university of Toronto	1,3,3-Trimethyl-6'-nitrospiro [indoline-2,2'-chromene]	0.05w% of silicone oil	-	-	-	-
Tracer particles	Gold-coated acrylic sphere particles	Soken Chemical & Engineering Co., Ltd.	Dia.=180 micrometer	2000particles	1364.27	N/A	N/A	-

[Experiment Table]

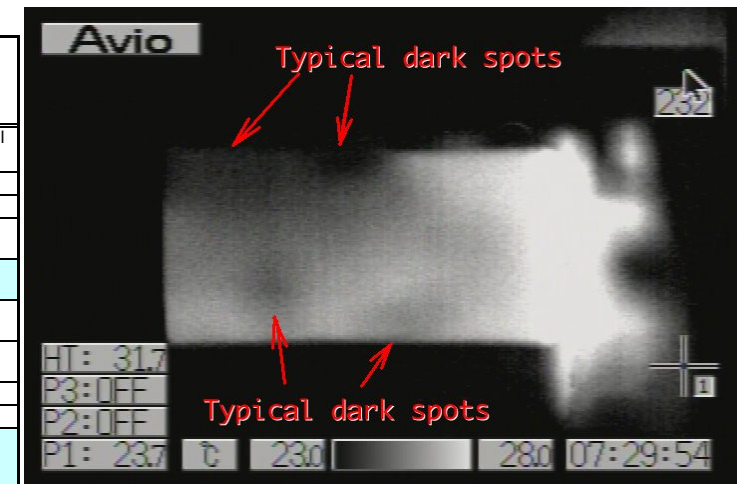
Exp. No.	Exp. Day(JST)	Team	Exp. Day (GMT)	Disk Dia.	Target LB Length (corrected) [mm]	initial gap [mm]	"CD posn" at Exp. end [mm]	AR (L/D)	Typical VR (V/V ₀)	Target	measuring point in IR image, coordinate (X1, Y1), see Pic.-1	note
MEIS3-C/O (MEIS3-1)	2011/9/20	JAXA/nishino	2011/9/19-20	30	18.9	0.301	0.729	0.63	-	-	-	check out day for features of this Experiment Cell and PAS researching
MEIS3-2	2011/9/21	nishino	2011/9/20-21	30	13.5, 12.0	1.03	0	0.45, 0.4	0.8-0.95	PAS	(232,119)	
MEIS3-3	2011/9/22	nishino	2011/9/21-22	30	10.5	1.03	0	0.35	0.80	PAS	(232,119)	air bubble removal, mode 2, PAS
MEIS3-4	2011/9/23	nishino	2011/9/22-23	30	10.5	1.03	0	0.35	0.6-0.8	the influence to critical point by volume ratio, and the influence to critical point by volume ratio	(232,119)	mode 2, PAS
MEIS3-5	2011/9/28	nishino	2011/9/27-28	30	15.0	1.03	0	0.50	0.6-0.8	the influence to critical point by volume ratio	(232,119)	air bubble removal
MEIS3-6	2011/9/29	nishino	2011/9/28-29	30	15.0	1.03	0	0.50	0.8-1.1	the influence to critical point by volume ratio	(232,119)	
MEIS3-7	2011/9/30	nishino	2011/9/29-30	30	15.0	1.03	0	0.50	0.45-0.9	the influence to critical point by volume ratio	(232,119)	air bubble removal
MEIS3-8	2011/10/1	nishino	2011/9/30-10/1	30	22.5, 15.0	1.03	0	0.75, 0.5	0.95	critical ΔT	(232,119)	
MEIS3-9	2011/10/5	ohnishi	2011/10/4-5	30	26.1, 27.9	1.03	0	0.87, 0.93	0.95	critical ΔT	(232,119)	
MEIS3-10	2011/10/6	ohnishi	2011/10/5-6	30	30.0	1.03	0	1.00	0.95	the influence to critical point by rate of temperature increase	(232,119)	
MEIS3-11	2011/10/11	ohnishi	2011/10/10-11	30	30.0	1.03	0	1.00	0.95	the influence to critical point by rate of temperature increase	(232,119)	
MEIS3-12	2011/10/13	ohnishi	2011/10/12-13	30	37.5, 33.6	1.03	0	1.25, 1.12	0.95	critical ΔT	(232,119)	air bubble removal
MEIS3-13	2011/10/18	ueno	2011/10/17-18	30	41.3	1.03	0	1.375	0.95	critical ΔT	(232,119)	
MEIS3-14	2011/10/19	ueno	2011/10/18-19	30	45.0, 52.5	1.03	0	1.5, 1.75	0.95	critical ΔT	(232,119)	
MEIS3-15	2011/10/20	ueno	2011/10/19-20	30	52.5, 48.75	1.03	0	1.75, 1.625	0.95	critical ΔT	(232,119)	
MEIS3-16	2011/10/21	ueno	2011/10/20-21	30	18.9, 26.1	1.03	0	0.63, 0.87	0.95	critical ΔT	(232,119) ->(193,119) ->(205,119)	
MEIS3-17	2011/10/25	nishino	2011/10/24-25	30	10.5	1.03	0	0.35	0.6-0.8	the influence to critical point by volume ratio, and PAS	(232,119)	
MEIS3-18	2011/10/26	nishino	2011/10/25-26	30	10.5	1.03	0	0.35	0.65-0.85	the influence to critical point by volume ratio	(232,119)	
MEIS3-19	2011/10/27	nishino (yano)	2011/10/26-27	30	30	1.03	0	1.00	0.6-0.8	the influence to critical point by volume ratio	(188,119)	
MEIS3-20	2011/10/28	nishino (yano)	2011/10/27-28	30	30	1.03	0	1.00	0.5-0.65	the influence to critical point by volume ratio	(188,119)	
MEIS3-21	2011/11/1	ueno	2011/10/31-11/1	30	60	1.03	0	2.00	0.95	critical ΔT	(188,119)	
MEIS3-22	2011/11/2	ueno	2011/11/1-2	30	48.75	1.03	0	1.625	0.95	critical ΔT	(188,119)	
MEIS3-23	2011/11/4	ohnishi	2011/11/3-4	30	30	1.03	0	1.00	0.45, 0.65	the influence to critical point by volume ratio	(186,119)	
MEIS3-24	2012/1/15	ueno	2012/1/14-15	30	30	1.03	11.97	1.00	0.95	critical ΔT, High Ma Number	(186,119)	Liquid Bridge length (corrected) is 13[mm] at the experiment end. After experiment, FPEF has been kept power-on mode to keep the C-D position data.
MEIS3-25	2012/1/16	ueno	2012/1/15-16	30	30	1.03	13.97	1.00	0.60	transition process to Chaos	(188,117)	Liquid Bridge length (corrected) is 15[mm] at the experiment end
MEIS3-26	2012/1/27	ohnishi	2012/1/26-27	30	(45)	15.00	7.2	(1.50)	-	Detached mode (Liquid Drop)	(222,117)	0-position detecting mode
MEIS3-27	2012/2/7	kawamura	2012/2/6-7	30	(45)	7.20	18.8	(1.50)	-	Form Liquid Drop -> Re-wetting process	(222,117)	After experiment, FPEF has been kept power-on mode to keep the C-D position data.
MEIS3-28	2012/2/8	nishino	2012/2/7-8	30	(32.0, 33.0)	7.20	5.8	(1.07, 1.1)	-	Detached mode -> Re-wetting	(222,117)	After experiment, FPEF has been kept power-on mode to keep the C-D position data.
MEIS3-28'	2012/2/8	nishino	2012/2/8	30	60	7.20	0	2.00	-	High-Marangoni Number with Crew activity -> dividing Liquid Bridge -> Re-wetting	(222,117)	

related telemetry ID: J#P0600J04310, J#P0600J04320
 resolution of original IR image inside IR camera: 320x236 (16bit)



Pic.-1 Coordinate of IR image

The Liquid Bridge size on above image: Dia.=30[mm], L=60[mm]



Pic.-2 typical dark spots on IR image

Video Compression system has been changed from 26/01/2014. The time information section in MPEG2 data changed with this change. New section of the time information is in GOP section.