

Marangoni Experiment In Space series-4

[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
 MEIS4: Marangoni Experiment In Space series-4
 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 disk
 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) + 1.7[K]	Argon(94.3%)+Air(5.7%)

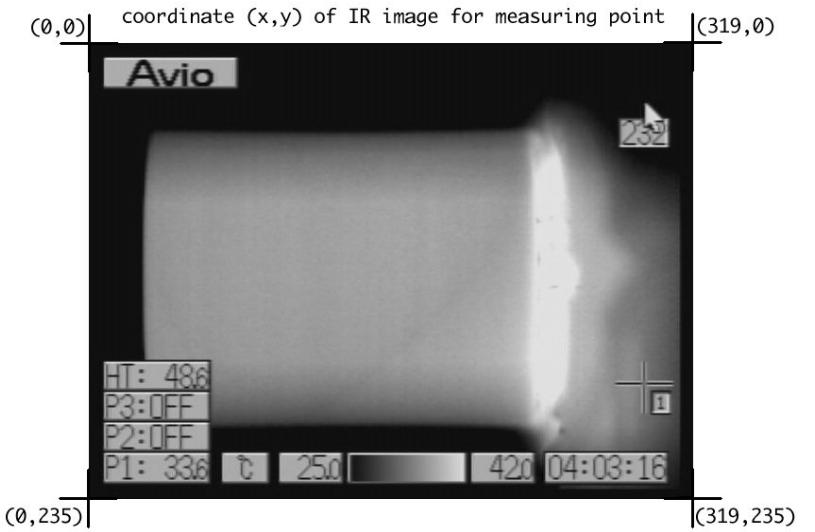
[Experiment sample]

	Material name	Manufacture	Model number, Character	amount	density @25 degree 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-06	-6.24E-05	9.67E-08
Dye	N/A							
Tracer particles	Gold-coated acrylic sphere particles	Soken Chemical & Engineering Co., Ltd.	Dia.=180 micrometer	500 particles (1.62mg)	1364.27	N/A	N/A	-

[Experiment Table]

Exp. No.	Exp. Day(JST)	Team	Exp. Day (GMT)	Disk Dia.	Target LB Length (corrected)	initial gap	"CD posn" at Exp. end	AR (L/D)	Typical VR (V/V ₀)	Target	measuring point in IR image, coordinate (X1, Y1), see Pic.-1	note
unit	YYYY/MM/DD		YYYY/MM/DD-DD	[mm]	[mm]	[mm]	[mm]					
MEIS4-C/O1	2010/8/27	JAXA	2010/8/27	50	-	0.20	0	-	-	-	-	check out day-1 for 3D camera focus.
MEIS4-C/O2	2010/9/21	JAXA	2010/9/20-21	50	-	0.20	0.30	-	-	-	(230,125)	check out day-2 for experiment system. The initial gap was set to 0.5mm.
MEIS4-1	2010/10/26	nishino	2010/10/25-26	50	25.0	0.50	0	0.50	0.95	critical ΔT	(230,125)	
MEIS4-2	2010/10/27	nishino	2010/10/26-27	50	37.5	0.50	0	0.75	0.95	critical ΔT	(230,120)	
MEIS4-3	2010/10/28	nishino	2010/10/27-28	50	62.5	0.50	0	1.25	0.97	critical ΔT	(180,122)	
MEIS4-4	2010/10/29	nishino	2010/10/28-29	50	25.0	0.50	0	0.50	0.95-1.0	critical ΔT	(204,122)	No VRU Recording
MEIS4-5	2010/11/3	ueno	2010/11/2-3	50	43.5	0.50	0	0.87	0.97	critical ΔT	(180,122)	No VRU Recording
MEIS4-6	2010/11/4	ueno	2010/11/3-4	50	43.5	0.50	0	0.87	0.97	critical ΔT	(171,122)	
MEIS4-7	2010/11/5	ueno	2010/11/4-5	50	22.5	0.50	0	0.45	0.95	critical ΔT	(171,122)	
MEIS4-8	2010/11/6	ueno	2010/11/5-6	50	31.5	0.50	0	0.63	0.96	critical ΔT	(171,122)	
MEIS4-9	2010/11/9	ohnishi	2010/11/8-9	50	20.0	0.50	0	0.40	0.95	critical ΔT	(171,122)	
MEIS4-10	2010/11/10	ohnishi	2010/11/9-10	50	16.5	0.50	0	0.33	0.95	critical ΔT	(216,122)	
MEIS4-11	2010/11/11	ohnishi	2010/11/10-11	50	50.0	0.50	0	1.00	0.95	critical ΔT	(216,122)	
MEIS4-12	2010/11/12	nishino	2010/11/11-12	50	15.0, 12.5	0.50	0	0.3, 0.25	0.95	critical ΔT	(221,122)->(223,122)	
MEIS4-13	2010/11/18	nishino	2010/11/17-18	50	56.0	0.50	0	1.12	0.98	critical ΔT	(216,122)	Liquid Bridge swing
MEIS4-14	2010/11/19	nishino/sakurai	2010/11/18-19	50	46.5	0.50	0	0.93	0.98	critical ΔT	(216,122)->(159,122)	Liquid Bridge swing
MEIS4-15	2010/11/24	ohnishi	2010/11/23-24	50	25	0.50	0	0.50	0.915, 1.0	influence to critical point by volume ratic	(229,122)->(207,122)	
MEIS4-16	2010/11/30	ohnishi	2010/11/29-30	50	25	0.50	0	0.50	0.975, 1.05	influence to critical point by volume ratic	(207,122)	
MEIS4-17	2010/12/2	ohnishi	2010/12/1-2	50	25	0.50	0	0.50	0.95, 0.91	influence to critical point by volume ratic	(207,122)	
MEIS4-18	2010/12/7	nishino	2010/12/6-7	50	37.5	0.50	0	0.75	0.95	critical ΔT	(180,122)	
MEIS4-19	2010/12/8	nishino	2010/12/7-8	50	50	0.50	0	1.00	0.95	observation on high Marangoni number	(160,122)	
MEIS4-20	2010/12/10	nishino	2010/12/9-10	50	40.5	0.50	0	0.81	0.95	critical ΔT	(180,122)	No image data from 0:20 to Exp. end, according to malfunction of IPU.
MEIS4-21	2010/12/14	ueno	2010/12/13-14	50	16.5	0.50	0	0.33	0.95	hysteresis	(218,122)	No VRU Recording
MEIS4-22	2010/12/15	ueno/sakurai	2010/12/14-15	50	-	-	-	-	-	critical ΔT	(218,122)	No experiment data. The experiment was aborted by communication line error.
MEIS4-23	2010/12/16	ueno	2010/12/15-16	50	62.5	0.50	0	1.25	0.95	observation on high Marangoni number	(218,122)	
MEIS4-22R	2010/12/17	nishino	2010/12/16-17	50	25	0.50	0	0.50	0.95	critical ΔT	(218,122)->(180,122)	This experiment is a substitute of the aborted MEIS4-22.
MEIS4-24	2010/12/22	ueno	2010/12/21-22	50	11.25, 10.0, 25.0	0.50	0	0.225, 0.2, 0.5	0.95	critical ΔT	(218,122) ->(228,122) ->(202,122)	

related telemetry ID: J#P0601J04310, J#P0601J0432C
 resolution of original IR image inside IR camera: 320x236 (16bit)



Pic.-1 Coordinate of IR image

The Liquid Bridge size on above image: Dia.=50[mm], L=62.5[mm]