The 17th International Conference on Environmental Ergonomics ICEE2017

November 12 – 18, 2017
Kobe, Japan

Editors:
ICEE2017 Local Organising Committee

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PROGRAMME SCHEDULE

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The proceedings in this publication have been reviewed by at least one independent reviewer and have subsequently been revised by the author(s) before inclusion.

Environmental Ergonomics XVII / editors Local organising committee. International Society for Environmental Ergonomics.

PREFACE

It is a great pleasure to introduce the 17th International Conference on Environmental Ergonomics (ICEE) held in Kobe, Japan from November 12th to 18th 2017. This is the second time that the ICEE has been held in Japan, where previously it was held in Fukuoka in 2002. The host city of Kobe is a vibrant port city and hub for people, information and goods from around the world. Kobe's location nestled between the mountains and sea gives the city beautiful natural diversity and is convenient to visit other attractive cities such as Kyoto, Osaka, Nara, Himeji in Kansai. In addition, Kobe has a laid-back and open atmosphere, which can be enjoyed all throughout the year. The month of November should be especially beautiful for viewing the autumnal colors around the city and mountainside. We trust that you will have a fruitful and pleasant visit to Kobe and Kansai area in Japan.

We are pleased to announce that over 200 people have registered for the conference, coming from 27 countries. ICEE is a small, single session, family type meeting that always provides a great opportunity for researchers to come together and discuss relevant topics in our field of research. The conference attracts researchers throughout all stages of their research career and has been particularly keen on supporting the next generation. This year has been no exception as we have awarded 67 free student places. In addition we have created two Early Career Research Symposiums to continue our support post PhD graduation. We have three fantastic sessions from senior scientist, including a special symposium focused on Asian populations. The calibre of the research continues across a total of 91 oral presentations and 93 poster presentations. The International and Local Organizing Committee reviewed all papers.

In total 23 sponsors have supported ICEE2017, Kobe. We are very grateful for the support of all sponsors, with special thanks for the continued support from WL Gore & Associates for funding the presenting students. In addition, we are grateful to Experimental Physiology and The Physiological Society for their generous donation towards the best student oral and poster presentation prizes. We would like to take this opportunity to thank all participants and the ICEE Executive Committee for entrusting us with such a fantastic opportunity to organize ICEE2017. We warmly welcome you all and hope that you have a great time for science and social activities in ICEE2017, Kobe.

ICEE2017 Local Organising Committee

ICEE2017 Local Organising Committee

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Yoshimitsu Inoue (Osaka International University)

Takeshi Nishiyasu (Tsukuba University)

Nicola Gerrett (Kobe University)

Naoto Fujii (Tsukuba University)

Tatsuro Amano (Niigata University)

Dai Okushima (Kobe Design University)

ICEE2017 Conference Website:

http://icee2017.h.kobe-u.ac.jp/ICEE2017_c/Welcome.html

An introduction to the history of the International Conference on Environmental Ergonomics:

http://www.environmental-ergonomics.org/

Location: Ikuta Shrine Hall

1-2-1 Shimo Yamate Dori Chuou ku, Kobe 650-0011, Japan

Floor map

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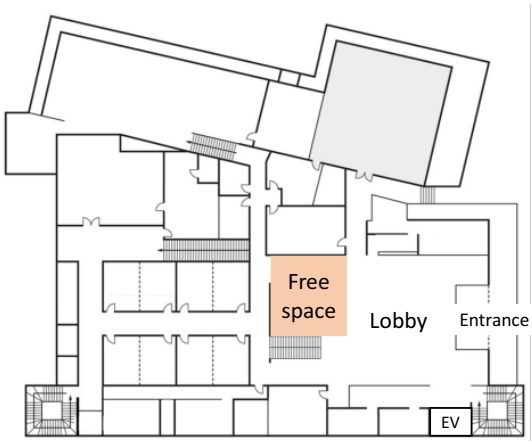

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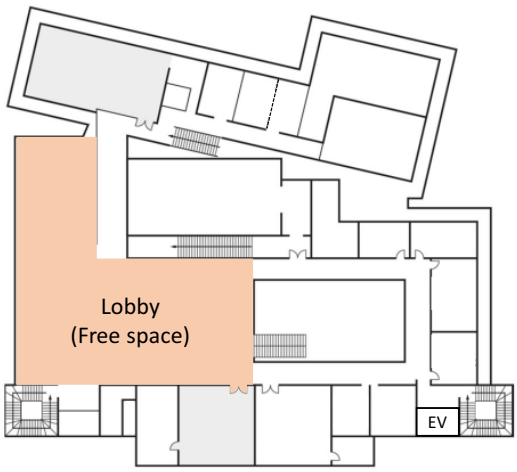

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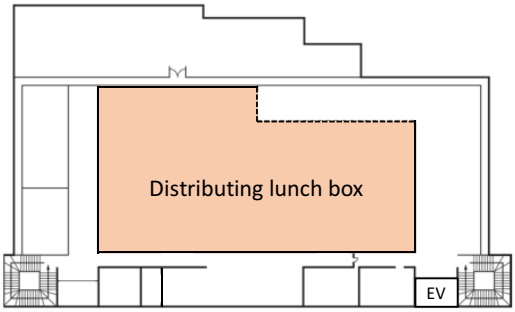

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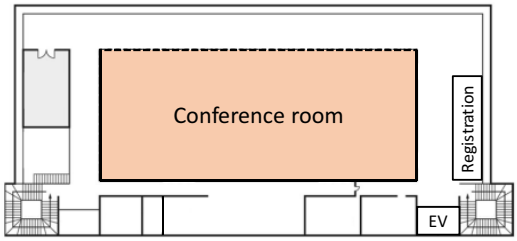

ICEE 2017 Week Schedule

Date/Time	Sunday 12th November
16:00-18:00	Registration

Date/Time	Monday 13th November
7:30-8:30	Registration
8:30-8:50	Welcoming address: Prof Kondo
8:50-9:30	Keynote speaker: Prof Morimoto
9:30-10:20	Oral presentation 1: **Temperature regulation 1** (x4)
10:20-11:00	Coffee break & poster presentations 1 (x20)
11:00-12:15	Oral presentation 2: **Occupation** (x6)
12:15-13:35	Lunch, Experimental Physiology announcement by Dr. Tipton
13:35-15:05	Symposium 1: Early Career researchers 1 : **Heat loss response**
15:05-15:45	Coffee break & poster presentations 1 (x20)
15:45-16:40	Oral presentation 3: **Perception 1** (x3)
16:40-17:10	JSPS announcement
17:10-17:50	Meeting adjourned for the day. Announcements. Group Photo
18:00-20:00	Welcome reception

Date/Time	Tuesday 14th November
7:30-8:00	Registration
8:00-9:15	Oral presentation 4: **Physiology and Exercise Physiology** (x6)
9:15-9:55	Coffee break & poster presentations 2 (x20)
9:55-10:45	Oral presentation 5: **Materials and design 1** (x4)
10:45-12:00	Oral presentation 6: **Materials and design 2** (x6)
12:00-13:20	Lunch
13:20-15:20	Symposium 2: **Aging in a Hotter World**
15:20-16:10	Oral presentation 7: **Temperature regulation 2** (x4)
16:10-16:50	Coffee break & poster presentations 2 (x20)
16:50-17:30	Oral presentation 8: **Heat Exposure 1** (x3)
17:30-18:10	Oral presentation 9: **Heat exposure and Adaptation** (x3)
18:10-18:20	Meeting adjourned for the day. Announcements
18:45-late	Student party

Date/Time	Wednesday 15th November
7:30-8:00	Registration
8:00-9:15	Oral presentation 10: **Exercise performance** (x6)
9:15-9:45	Poster presentations 3 (x20)
9:45-10:35	Oral presentation 11: **Fire fighters** (x4)
10:35-11:15	Coffee break & poster presentations 3 (x20)
11:15-12:45	Symposium 3: **Clothing assessment and Development**
12:45-14:05	Lunch
14:05-14:15	Meeting adjourned for the day. Announcements

Date/Time	Thursday 16th November
7:30-8:00	Registration
8:00-9:05	Oral presentation 12: **Perception 2** (x5)
9:05-10:10	Oral presentation 13: **Heat adaptation** (x5)
10:10-10:50	Coffee break & poster presentations 4 (x20)
10:50-11:50	Oral presentation 14: **Temperature regulation 3** (x5)
11:50-13:10	Lunch
13:10-14:40	Symposium 4: **Thermoregulation in Asians**
14:40-15:20	Coffee break & poster presentations 4 (x20)
15:20-16:25	Oral presentation 15: **Modeling and design** (x5)
16:25-17:15	Oral presentation 16: **Temperature regulation 4** (x4)
17:15-17:25	Meeting adjourned for the day. Announcements

Date/Time	Friday 17th November
7:30-8:00	Registration
8:00-8:50	Oral presentation 17: **Temperature regulation 5** (x4)
8:50-9:55	Oral presentation 18: **Sports Clothing** (x5)
9:55-10:35	Coffee break & poster presentations 5 (x19)
10:35-11:15	Oral presentation 19: **Heat exposure 2** (x3)
11:15-11:55	Oral presentation 20: **Body morphology** (x3)
12:00-13:20	Lunch
13:20-14:50	Symposium 5: Early Career researchers 2: **Adaptation**
14:50-15:30	Coffee break & poster presentations 5 (x19)
15:30-16:00	Closing ceremony and Awards
18:30-21:30	Conference Banquet

Date/Time	Saturday 18th November
9:00-12:00	Interesting Group Meeting for Environmental Ergonomics (Kobe University)

ICEE2017 Abstracts

Hunt	Agreement between the measured and estimated effects of wind-speed on the heat exchange properties of military protective clothing	49	3
Wang **(s)**	The application of 3D scanning technology in the assessment of protective clothing and its validity verification	50	4
Eckels	Determining temperature ratings for children's sleeping bags	51	5
Bernard	Exertional heat illness and acute injury related to WBGT during deepwater horizon clean-up	52	6
Su **(s)**	Performance analysis of membrane fabric used for thermal protective clothing in steam and radiant hazards	53	7
Wang	Body-mapping nano-porous polyethylene (PE) clothing could prompt radiative body heat dissipation in moderate warm indoor environments	54	8
Chen	A novel high elastic fabric with comfortable properties developed for burn survivors	55	9
Roh **(s)**	Regional differences in skin hydration on the hand by medical glove type	56	10
Ruan **(s)**	Effects of bathing on psychophysiological responses in the elderly and the young males	57	11
Watanabe **(s)**	Study on psychological effects by reproduction of ambient music and sound effects	58	12
Kim **(s)**	Self-identified thermal comfort zone and perceived climate changes: a questionnaire study in temperate, tropical and cold climates	59	13
Otani	Effects of variations in air velocity on endurance exercise capacity and thermoregulation in a hot environment	60	14
Coull **(s)**	Thermal sensitivity to a warm and a cold stimulus: An age comparison	61	15
Oue	Effect of short-term endurance interval training on venous compliance in humans	62	16
Stadnyk **(s)**	Functional and physical adaptations to resistance training with external muscle heating	63	17
West **(s)**	Shoe microclimate: an objective and subjective evaluation	64	18
Bratadewi **(s)**	Effects of cold young coconut water ingestion for precooling on physiological responses during exercise in hot and humid environment	65	19
Lasisi	Thermoregulatory properties of hair: is human hair morphology adaptive?	66	20
ORAL **Tue 09:55-10:45**	**Materials and design 1** Chair and co chair: Edith Classen and Adam Potter	Abstract page	

Ang	Effects of training in cool vs. warm environment on subsequent aerobic performance in a warm and humid condition	98	
POSTER Wed 09:15-09:45	**Poster session 3**	**Abstract page**	**Board no**
Wu	Heat stress evaluation of miners in hot underground coal mines using an improved predicted heat strain model and an improved thermophysiological model	99	1
DenHartog	Development and validation of bench-level and manikin test methods to predict heat related comfort properties of mattresses	100	2
Hirata	Fast computation of temperature and water loss in human models for simultaneous exposure to ambient heat and solar radiation	101	3
Potter **(s)**	How much of a difference in evaporative potential is important?	102	4
Tsoutsoubi **(s)**	Influence of thermal balance on reactive hyperaemia	103	5
Amorim **(s)**	Incidence of heat waves in Cyprus and its association with mortality	104	6
Kim **(s)**	Effects of dual-functional vest with body cooling and drinking water supply on the alleviation of heat strain	105	7
Sumisato **(s)**	Observation and questionnaire on the relationship between the thermal index ETVO and behavior of people in Kyoto	106	8
Ioannou **(s)**	Physical demands and hydration status of grape-picking workers in Europe	107	9
Ozaki	Conductive heat loss with aluminum sheet in wet condition	108	10
Horiuchi	Impact of combined cool and hypoxic exposures on energy cost during walking in healthy adults	109	11
Thake	Shake-Spear 17: Normoxic and hypoxic peak exercise responses before and after an Antarctic traverse	110	12
Ohtaka	Control strategies for accurate force generation and relaxation in isometric contraction of lower limb	111	13
Gleadall-Siddall **(s)**	Reliability of oxidative stress parameters and repeated 16.1 km time trial performance	112	14
Cheung	The effects of local muscle cooling on motor unit firing properties	113	15
Fukuba	Dissociated dynamics of brachial artery and forearm skin blood flows during sinusoidal leg cycling exercise	114	16
Massey	Size does matter! Conductive toe skin cooling in matched male and female volunteers	115	17
Ichinose	Reduction of venous return abolishes muscle metaboreflex-mediated rise in cardiac output in exercising humans	116	18

ORAL Thur 09:05-10:10	**Heat adaptation** Chair and co chair: Stephen Chueng and Nicole Coull	Abstract page
Garrett	Effectiveness of short-term heat acclimation on intermittent exercise in the heat with moderately-trained females controlling for menstrual cycle phase	132
Kirby **(s)**	Heat acclimation for female endurance performance in hot and normothermic conditions	133
Poirier **(s)**	Does heat acclimation improve whole-body heat loss in older men?	134
Stanley	Divergent physiological adaptations from short-term heat acclimation in dry vs humid conditions at equivalent heat index: no performance change in temperate conditions	135
Garrett	Effectiveness of short-term heat acclimation on intermittent exercise in the heat with moderately-trained males	136

POSTER Thur 10:10-10:50	**Poster session 4**	**Abstract page**	**Board no**
Bae **(s)**	Classification of manual dexterity and mobility for firefighter's protective gloves using Don-doff, ASTM dexterity, Minnesota dexterity, Bennett hand tool and ASTM torque tests	137	1
Kim **(s)**	Maximum heart rate as a correction factor in predicting firefighters' rectal temperature using heart rate	138	2
Kim	Firefighter's personal protective equipment and burn injuries: an empirical study in Korea	139	3
Watkins **(s)**	Fire service instructors' working practices: A United Kingdom Survey	140	4
Lu	The impact of shape memory alloy size on the protective performance of fabrics used in fire-fighter's protective clothing	141	5
Tokizawa	Effects of combined cooling applications before and during exercise on heat strain while wearing protective clothings	142	6
Potter **(s)**	Effects of layering on thermal insulation and vapor permeability	143	7
Miyazawa **(s)**	Airflow in microenvironment under sportswear generated by running motion	144	8
Moran	Physiological and logistic considerations in the integration of females in the IDF combat units	145	9
Tyler	The effect of high-intensity short-term heat acclimation on exercise capacity in the heat in trained cyclists	146	10
Park	Effects of 14-day acclimation to cold and heat on cold tolerance in males	147	11
Ueda	Sex differences in the development of peripheral sudomotor sensitivity to acetylcholine	148	12

POSTER Fri 09:55-10:35	**Poster session 5**	**Abstract page**	**Board no**

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The Graduate School of Human Development and Environment at Kobe University and Kobe Active Aging Research Hub	*http://www.h.kobe-u.ac.jp/en/node/1023* *https://www.h.kobe-u.ac.jp/en/node/3710*
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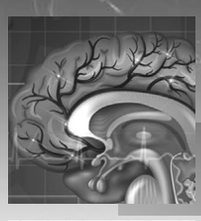
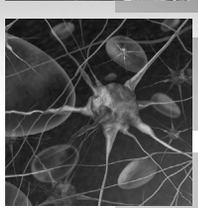


Measurement parameters

O_2Hb Oxygenated Hemoglobin Concentration



HHb Deoxygenated Hemoglobin Concentration

tHb Total Hemoglobin Concentration

StO_2 Oxygen Saturation of Hemoglobin

tNIRS-1

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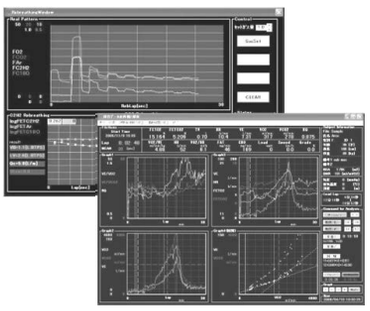
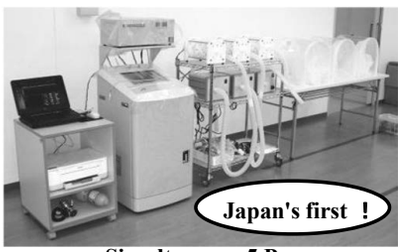
～Measurement of Basal Metabolism, VO2max, AT, Trace Gases～





Simultaneous 5 Person Measurement by Mixing Chamber

It is possible to construct a highly precise and multifunctional system that makes use of the high-speed response performance unique to mass spectrometers and the simultaneous continuous analysis function of up to 8 kinds of gases. It is possible to correspond to human, animals, microorganisms, cells, plants.

Qjirou

Portable Gas Analyzer [AR-10 O2郎]

[Portable Gas Monitor AR-10]

Measurement of Energy Consumption for Human

Measurement by three methods is possible

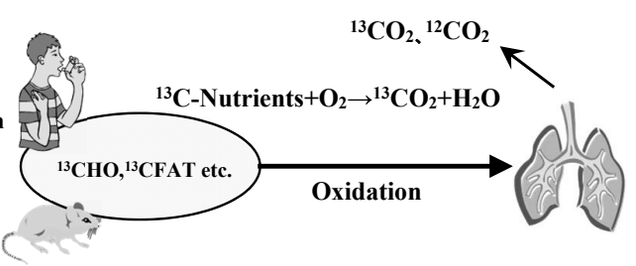
Mask

Douglas Bag

Hood

$^{13}CO_2/^{12}CO_2$ Stable Isotope Measurement

In our mass spectrometry system , we can measure $^{13}CO_2$ which is a burned substance by administration of various ^{13}C-labeled compounds. Simultaneous continuous analysis with energy metabolism factors such as VO_2, VCO_2, RQ and so on is possible at the same time as $^{13}CO_2/^{12}CO_2$ analysis which can grasp the combustion dynamics of administered nutrients such as carbohydrates and lipids. Application to animals and microorganisms is also possible.



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Chiba JAPAN

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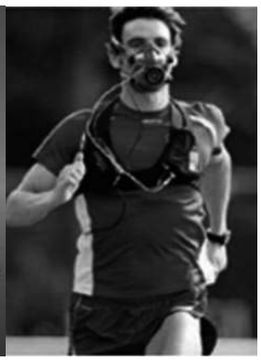

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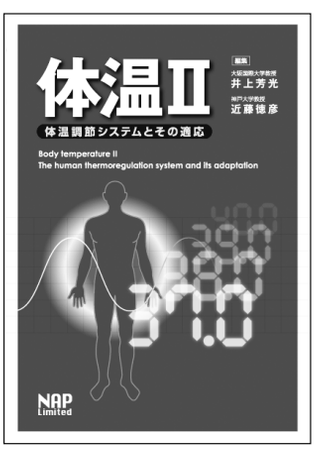

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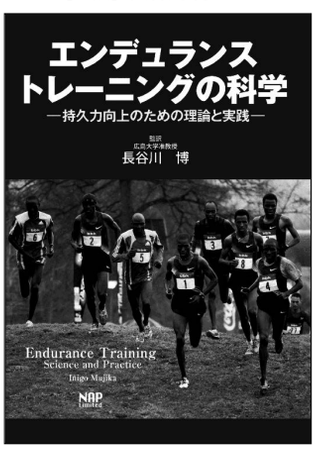

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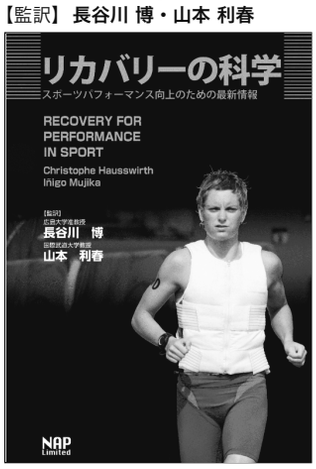

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The LCG tube suit consists of a 3 pieces(hood and jacket and pants) by connecting the tube hose.

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The CorTemp Data Recorder receives the signal from the CorTemp Core Body Temperature Pill Sensor.
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