The timetable of the 180th ISIJ Online Meeting
(September 16–18, 2020)

Session Room	Sept. 16 (Wed.)		Sept. 17 (Thu.)		Sept. 18 (Fri.)	
	AM	PM	AM	PM	AM	PM
Session Room 1	Technology of cokemaking / Fundamentals of ironmaking [1–8] (9:00–12:00)	Behavior of iron ore in blast furnace / Phenomena in lower part of blast furnace [13–21] (13:00–16:20)	Processes of iron ore treatment for increasing resource flexibility and resolving environmental problem in the future [D1–D10] (9:00–16:15)		Sintering [37–42] (9:40–11:40)	Young engineer session of ironmaking / Young engineer session of cokemaking [48–56] (13:00–16:20)
Session Room 2	Thermodynamics [9–12] (10:20–11:40)	Hot metal treatment and converter / Secondary refining and refractory / Continuous casting and solidification [22–30] (13:00–16:40)	Solidification and structure control 1・2 [31–36] (9:20–11:40)	---	Electromagnetic processing of materials [43–47] (10:00–11:40)	Introduction of research topics in novel processing forum / Slag and dust treatment 1・2 [57–66] (13:00–17:00)
Session Room 3	Cutting-edge of green energy technologies contributing sustainable progress in the iron & steel industry [67–71] (9:00–10:40)	Energy-saving and CO_2 emission reduction [72–74] (13:00–14:00)	Present maintenance situation of aging infrastructures [D11–D21] (9:20–15:30)		---	---
Session Room 4	Recent trends on systems resilience to realize both maximum efficiency and operational stability [D22–D26] (9:00–12:15)	System and control [75–77] (13:00–14:00)	Human-system shared control realizing high efficient and stable rolling [D27–D30] (9:30–12:00)	Steel plant equipment diagnosis using area sensing technology / Instrumentation [78–85] (13:00–16:10)	---	---
Session Room 5	---	---	Reliability evaluation of steel weld 2 –1・2 [86–91] (9:40–12:00)	Cooling and lubrication / Oxide scale / Constitutive equations [92–101] (13:00–17:00)	Young engineer's latest researches on tubes and pipes 3 –1・2 [102–107] (9:40–12:00)	Ductile fracture: Mechanisms, origin, effects & control [D31–D35] (13:00–15:50)
Session Room 6	Heterogeneous deformation and work hardening in steels [D36–D45] (9:00–15:50)		Electrical steel [149–152] (10:00–11:20)	Strength and deformation behavior 1・2 [164–172] (13:00–16:30)	Hydrogen embrittlement 1・2 [181–189] (9:00–12:20)	Hydrogen embrittlement 3・4 [190–197] (13:20–16:20)
Session Room 7	Surface technology [108–109] (10:00–10:40)	Heat resistant steels / Heat resistant alloys [123–129] (13:00–15:50)	Toughness, Ductility, Fatigue property [137–140] (10:40–12:00)	Machine structural steel [153–155] (13:00–14:00)	---	---
Session Room 8	Steel informatics 1・2 [110–116] (9:00–11:40)	Steel informatics 3・4 [130–136] (13:00–15:40)	Aging and Precipitation / Diffusional phase transformation 1 [141–148] (9:00–12:00)	Diffusional phase transformation 2・3 [156–163] (13:00–16:00)	Recovery and recrystallization / Modelling and simulation [173–180] (9:00–12:00)	---
Session Room 9	Stainless steel [117–122] (10:00–12:00)	---	---	Elemental analysis・Precipitate and inclusion analysis / Crystal structure analysis・On-site and on-line analysis [198–204] (13:30–16:10)	---	Advanced monitoring and analysis methods for industrial processes [Int.–1–Int.–6] (14:00–17:20)
Session Room 10	---	---	---	ISIJ and JIM joint session Titanium and its alloys 1・2・3 [J1–J10] (13:00–17:00)	---	---
JIM Room O	---	---	---	---	ISIJ and JIM joint session Ultrafine grained materials – fundamental aspects for ultrafine grained structures– 1・2 [J11–16] (9:00–11:20)	---
JIM Room Q	---	---	ISIJ and JIM joint session Materials science of martensitic and bainitic transformations and its applications 1・2・3・4 [J17–33] (9:00–16:20)		ISIJ and JIM joint session Materials science of martensitic and bainitic transformations and its applications 5 [J34–38] (9:00–10:40)	---

Symposium Room 1	---	Micro-analysis of corrosion phenomena on stainless steels (13:00–16:00) [Charge-free]	---	Quantitative analysis of macro- and micro-segregation and defect during solidification (13:00–16:25) [Charge-free]	---	Developing an LCA methodology with due consideration of Life-Cycle Value of Steel (13:00–17:00) [Charge-free]
Symposium Room 2	---	Advances in property characterization based on microstructural analysis using quantum beam (13:00–16:55) [Charge-free]	---	Accurate constitutive model for steel sheets and its application on tension leveling simulation (13:00–16:40) [Charge-free]	Recent measurement technology and its challenge of microstructure formation, property determination, quality assurance and process control of materials (09:00–12:00) [Charge-free]	---
Symposium Room 3	---	Final symposium of the research group of new functionalities of iron and steelmaking slags by biofilm coating (13:00–16:30) [Charge-free]	---	---	Investigation of metal corrosion in various environments ～material engineering・physicochemical・electrochemical・microbiological approaches～ (09:00–15:00) [Charge-free]	

[ ]: Lecture Number
( ): Lecture Time
: Those sessions will be hold using Zoom meeting.

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＊: Abstracts from the previous 179th ISIJ Meeting

Discussion Sessions

High Temperature Processes

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Processes of iron ore treatment for increasing resource flexibility and resolving environmental problem in the future

9:00-9:20
D1 Sintering process for increasing resource flexibility and resolving environmental problems — T. Murakami ・・・ 1*

9:20-9:55
D2 Effect of particle size of fine Hematite on characteristics and strength of quasi-particle — T. Maeda ・・・ 3*

9:55-10:30
D3 Numerical simulation of granulation of fine iron ore particles — H. Nakamura ・・・ 5*

10:40-11:15
D4 Influence of oxygen concentration and particle size on the combustion rate of coke and biomass char — A. Nakamura ・・・ 8*

11:15-11:50
D5 Acceleration of oxidation of iron bearing materials together with carbonaceous materials in sintering process — Y. Konno ・・・ 10*

13:10-13:45
D6 Analysis of the change of packed bed structure due to melt transfer between different types of granules — S. Ishihara ・・・ 12*

13:45-14:20
D7 Effect of iron ore type and gangue components on strength and texture of fine powder granule — S. Nakamura ・・・ 14*

14:30-14:55
D8 Effect of coarse pellet mixing ratio at bottom layer an sintering properties (Secretary studies in research group of sitering technology harmonized with iron resource and environment -1) — K. Miyagawa ・・・ 16*

14:55-15:20
D9 Mixed charging effect of green pellet and bonding agent to bottom layer on sintering properties (Secretary studies in research group of sintering technology harmonized with iron resource and environment-2) — T. Higuchi ・・・ 18*

15:20-15:45
D10 Elongation effect of high temperature zone in sintering bed at coexistence of biomass char and coke fine (Secretary studies in research group of sintering technology harmonated with iron resourse and environment-3) — M. Matsumura ・・・ 20*

Sustainable Systems

Present maintenance situation of aging infrastructures

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D11 Monitoring of the corrosion environment in the winter season — K. Azumi ・・・ 401

9:50-10:10
D12 Corrosion monitoring on simulated bridges using various atmospheric corrosion sensors — W. Oshikawa ・・・ 405

10:10-10:30
D13 Atmospheric corrosion monitoring in model structure for girder end of steel bridge — H. Katayama ・・・ 406

10:50-11:10
D14 Simulation of atmospheric corrosion using mathematical model — T. Igarashi ・・・ 407

11:10-11:30
D15 Numerical and experimental evaluation of corrosion rate of steel under a water droplet — E. Tada ・・・ 409

11:30-11:50
D16 Growth of solution layer due to deliquescence of NaCl particles and initial oxidation behavior of steel surfaces — K. Fushimi ・・・ 410

13:00-13:20
D17 Micro-electrochemistry of carbon steels in localized corrosion environments for mathematical modeling — M. Nishimoto ・・・ 411

13:20-13:40
D18 Weight gain rates of steels corroding for repeating dry and wet with controlled humidity — T. Haruna ・・・ 412

13:40-14:00
D19 (ISIJ Research Promotion Grant) 3D-Observation of pit formed on iron and steel under dry-wet cycling condition — M. Chiba ・・・ 413

14:20-14:40
D20 Evaluation of dissolved oxygen concentration and corrosion behavior in electrolyte film on rusted steels H. Tsuchiya ・・・ 415
14:40-15:00
D21 Changes in electrochemical behavior of steels with metal cations in NaCl solutions M. Sakairi ・・・ 416

Instrumentation, Control and System Engineering

Recent trends on systems resilience to realize both maximum efficiency and operational stability

9:00-9:30
D22 Prospects for research group on systems resilience to realize both maximum efficiency and operational stability N. Fujii ・・・ 418
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D23 Symbiosis with variabilities by systemic approaches: resilience in the post-coronavirus era T. Sawaragi ・・・ 421
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D24 A system of systems model for revealing resilience mechanism of production-logistics systems H. Mizuyama ・・・ 425
10:45-11:15
D25 Experimental study on the resilient performance to deal with unexpected situations M. Takahashi ・・・ 427
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D26 Expectations for the research project on resilient operations under aggressive environment H. Narazaki ・・・ 430

Instrumentation, Control and System Engineering / Processing for Quality Products

Human-system shared control realizing high efficient and stable rolling

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D27 Elementary analysis of rolling slip in cold strip rolling J. Yanagimoto ・・・ 432
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D28 Rolling theory using relative-velocity dependent friction law for machine learning H. Utsunomiya ・・・ 433
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D29 Data-driven approach to thickness control of cold tandem rolling mill - Examination used simulator - O. Kaneko ・・・ 435
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Processing for Quality Products

Ductile fracture: Mechanisms, origin, effects & control

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D31 Identification of flow stress and ductile fracture parameters with tensile test using image analysis and optimization technology Y. Yoshida ・・・ 22*
13:30-14:00
D32 Ductile fracture prediction in sheet and bulk metal forming processes by an ellipsoidal void model K. Komori ・・・ 26*
14:00-14:30
D33 Prediction of ductile fracture for steel considering stress triaxiality and multi-axis stress state N. Yukawa ・・・ 28*
14:40-15:10
D34 Study on evaluation of surface crack in hot forging H. Kakimoto ・・・ 30*
15:10-15:40
D35 Effect of rolling condition on ductile fracture at center of billet in piercing rolling T. Katsumura ・・・ 34*

Microstructure and Properties of Materials

Heterogeneous deformation and work hardening in steels

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D36 Discussion on the upper yielding mechanism based on the pile-up theory in polycrystalline ferritic steels T. Tsuchiyama ・・・ 442
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D37 Evaluation of pinning force of edge dislocation by nitrogen atoms in BCC iron by molecular dynamics method S. Oiwane ・・・ 445
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D38 Evaluation of mobile dislocations in 18%Ni martensitic steel by stress relaxation test Y. Takenouchi ・・・ 446

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D39 Phenomenological model for deformation inhomogeneity in tensile test and prediction of strain-stress response — T. Morikawa ・・・ 447

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D40 Crystal plasticity analysis of non-uniform plastic deformation behavior in core-shell structured dispersion strengthened alloy — Y. Okuyama ・・・ 449

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D41 Effect of carbon content on selection of slip system during tensile deformation of lath martensite — S. Nambu ・・・ 453

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D42 Strain distribution and deformation-induced martensitic transformation in tension for a TRIP steel plate — N. Koga ・・・ 456

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D43 (ISIJ Research Promotion Grant) Strategy for analyzing plasticity heterogeneity in medium Mn steels — M. Koyama ・・・ 460

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D44 Austenite reversion during intercritical annealing of Mn-added steels — G. Miyamoto ・・・ 461

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D45 Deformation behavior of medium manganese steels by neutron diffraction — S. Morooka ・・・ 462

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International Organized Sessions

Process Evaluation and Material Characterization
2020/9/18 Room 9

Advanced monitoring and analysis methods for industrial processes

Session Organizers: Y. Deguchi [Tokushima Univ.], S. Kashiwakura [Ritsumeikan Univ.]

14:00-14:05
Opening Address: Y. Deguchi [Tokushima Univ.]

Chair: Y. Deguchi [Tokushima Univ.]

14:05-14:35
Int.-1 Mutual classification of stainless steels by laser-induced breakdown spectroscopy together with ensemble machine learning
Ritsumeikan Univ. ○S. Kashiwakura・E. Yamasue ・・・ 466

14:35-15:05
Int.-2 Development of 2D/3D temperature imaging technology for iron and steel making processes using CT-TDLAS
Tokushima Univ. ○T. Kamimoto・Y. Deguchi ・・・ 467

15:05-15:35
Int.-3 (Invited Lecture) Long-short double pulse laser-induced breakdown spectroscopy for carbon detection in steel samples
Northwestern Polytechnical Univ. ○M. Cui, Tokushima Univ. Y. Deguchi,
Xi'an Jiaotong Univ. Z. Zhenzhen, Northwestern Polytechnical Univ. C. Yao・D. Zhang ・・・ 469

Chair: S. Kashiwakura [Ritsumeikan Univ.]

15:45-16:15
Int.-4 (Invited Lecture) Focus point effect on underwater measurement of solid samples using long-short DP-LIBS
Xi'an Jiaotong Univ. ○Z. Wang・K. Rong, Northwestern Polytechnical Univ. M. Cui,
Xi'an Jiaotong Univ. J. Yan, Tokushima Univ. Y. Deguchi ・・・ 471

16:15-16:45
Int.-5 Development of real-time elemental monitoring method in iron and steel making processes using long and short double-pulse laser-induced breakdown spectroscopy
Tokushima Univ. ○Y. Deguchi ・・・ 473

16:45-17:15
Int.-6 (Invited Lecture) Detection of carbon in steel using laser-induced breakdown spectroscopy (LIBS)
Central European Institute of Tech. ○J. Kaiser・P. Porizka・D. Prochazka ・・・ 476

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Closing Address: S. Kashiwakura [Ritsumeikan Univ.]

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3	Stabilization of coke oven dry main pressure	S. Agawa	478
4	Rebuild of Muroran No.5 coke oven west battery (Pad-up rebuild of Muroran No.5 coke oven west battery)	K. Tanaka	479
Fundamentals of ironmaking			
5	Developing dephosphorization technique for iron ore with reduction process	O. Ishiyama	480
6	Fundamental investigation of urea as reducing agent in ironmaking on a low-grade ore	A. Kurniawan	481
7	Effect of basicity of slag on the carburization and melting behavior of iron oxide-carbon composite	R. Higashi	482
8	Development of adiabatic counter current moving bed for shaft furnace reaction simulator	M. Mizutani	483
Thermodynamics			
9	(ISIJ Research Promotion Grant) Effects of FeO additions on sulfide capacities of $CaO-SiO_2$ slags	D. Mitsuyama	77*
10	Reevaluation of iso-activity curves for Fe_xO in $Fe_xO-CaO-SiO_2$ ternary system at 1573K	K. Saito	484
11	Determination of the activity coefficient of Ni in the molten Ag-Cu system	J. Li	485
12	Interaction parameters between Sn and Mo, B and Ni in molten Fe-18mass%Cr alloy	K. Hori	486
Behavior of iron ore in blast furnace			
13	3-Dimensional analysis of reduction behavior of iron ore particle	J. Kim	487
14	Estimation of shrinking behavior of pellet during softening process	N. Yasuda	488
15	Effect of metallic iron structure in pre-reduced pellet on high temperature softening behavior	I. Miyama	489
16	Effect of lump ore different on slag formation due to reaction with lime stone	T. Handa	490
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17	Prediction of pulverized coal combustibility by chemi-luminescence spectrometry	K. Moriya	491
18	Prediction method of hot temperature in blast furnace	K. Kamo	90*
19	3-dimensional coke degradation recognition system by using deep learning	S. Natsui	492
20	Estimation of coke degradation behavior in blast furnace by discrete element method	T. Iwanaga	493
21	Effect of gas velocity distribution in void of coke bed on pressure drop	A. Hirai	494
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22	(ISIJ Research Promotion Grant) Effect of stirring method and impeller design on dynamic deformation of free surface during mechanical stirring	T. Yamamoto	495
23	Effect of moving object submerged near bath surface on fluid motion	Y. Higuchi	496
24	Dynamic control of top blowing gas jet velocity by applying actuation gas I	N. Oda	124*
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26	Conditions of MgO and $MgO \cdot Al_2O_3$ inclusions formation in high chromium steel at 1873 K	K. Okumoto	497
27	Improvement in refractory around of bottom tuyere Q-BOP furnace	Y. Takashita	498
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28	The effect of alloy element on the macro segregation behavior in modified sato-mold ingots	Y. Sumi	499
29	Experimental verification of effect of carbon content on unevenness of initial solidification	K. Yamamoto	135*
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32	Change in the volume of Fe-0.05C steel during solidification by using time-resolved tomography	Y. Nanri	501
33	Effect of application of electric current on solidification morphology	Y. Totogawa	502

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35 Crystallographic orientation relationship between fine gamma grain after the massive-like transformation in Fe-18Cr-Ni alloy — T. Narumi · · · 140*

36 Simulations of microstructural evolution with high-frequency gamma-nucleation around peritectic temperature of Fe-C alloys — J. Ogawa · · · 146*

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38 Sintering machine charging test of carbon-core green pellet — K. Iwase · · · 504

39 Effect of limestone addition on the pore formation during composite sintering with green pellet — Y. Takahama · · · 505

40 Effect of quicklime replacement rate on the strength of sintered pellets prepared by the composite sintering process — Z. Ma · · · 506

41 Suppression of secondary hematite formation during cooling under low oxygen partial pressure — Y. Iwami · · · 507

42 Gas permeability measurement of iron ore sinters — D. Tahara · · · 508

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44 Effect of magnetic field gradient on liquid metal flow in packed bed — G. Kusunoki · · · 509

45 Evaluation of liquid velocity near solid-liquid interface under the superimposition of DC current and magnetic field with or without AC current — G. Xu · · · 510

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49 Improvement of assimilation and sinter productivity by using granulation with inclined mixing of lime (Development of granulation with inclined mixing of lime - 1) — M. Taniguchi · · · 512

50 Assimilation behavior of pseudo-particles between powder layers with different limestone content (Development of granulation with inclined mixing of lime - 2) — S. Yamazaki · · · 513

51 Influence of pre-reduction temperature on reduction behavior of pellets — S. Yamaki · · · 514

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Young engineer session of cokemaking

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54 Effect of temperature gradient on crack formation at high contraction vitrinite in coke — S. Konno · · · 102*

55 Coke oven combustion control by measuring gas flow rate in combustion flue — Y. Morita · · · 516

56 Establishment of extensive repair method in Oita DOC — A. Shiga · · · 517

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58 Effect of ultrasonic power on the nucleation under flow suppression condition — N. Tabayashi · · · 518

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61 Effect of mineral containing slag on expansion behavior of steelmaking slag — T. Sasaki · · · 520

62 Behavior of pH during dissolution of electric furnace oxidation slag irradiated with germicidal lamp into pure water — S. Yokoyama · · · 521

63 Relationship between silicate skeleton structure and dissolution kinetics of calcium-silicate mineral phases into water — F. Ruan · · · 522

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65 (ISIJ Research Promotion Grant) Estimation of electrical pulse disintegration behavior of steel co-products by electric field analysis — H. Kubo · · · 524

66 Cr removal from stainless slag by electrical pulse disintegration — H. Kubo · · · 525

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Sustainable Systems

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69	Kinetic analysis considering particle size distribution on Ca elution from slags I	Y. Kashiwaya	527
70	Kinetic analysis considering particle size distribution on Ca elution from slags II	Y. Kashiwaya	528
71	Micro-encapsulation of Al-Cu-Si ternary system phase change material for high-temperature applications	T. Kawaguchi	529
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72	Fabrication of $Ba_8Cu_xSi_{46-x}$ power generation material using thin film process	T. Nishijima	530
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Instrumentation, Control and System Engineering

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83	Development of the area measurement method of a solid iron (mushroom) on the tuyeres at the bottom of the converter	T. Ito	540
84	Poisson un-scarfing segmentation in hot scarfing process	Y. Konno	541
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93 Development of simulator of hearth roll-pickup in strip annealing line — S. Morishige · · · 206*

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96 Effects on remaining oxide of joining conditions in induction heating joining — T. Okazaki · · · 551

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100 Influence of holding strain and unloading on elongation in tensile testing of cold-rolled steel sheets — N. Ueshima · · · 196*

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104 Effect of bulging length on hydroformed tubing for providing tubes with thickness distribution — A. Shirayori · · · 556

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