AGENDA OF XCFD4NRS WORKSHOP

First Day, Wednesday, September 10

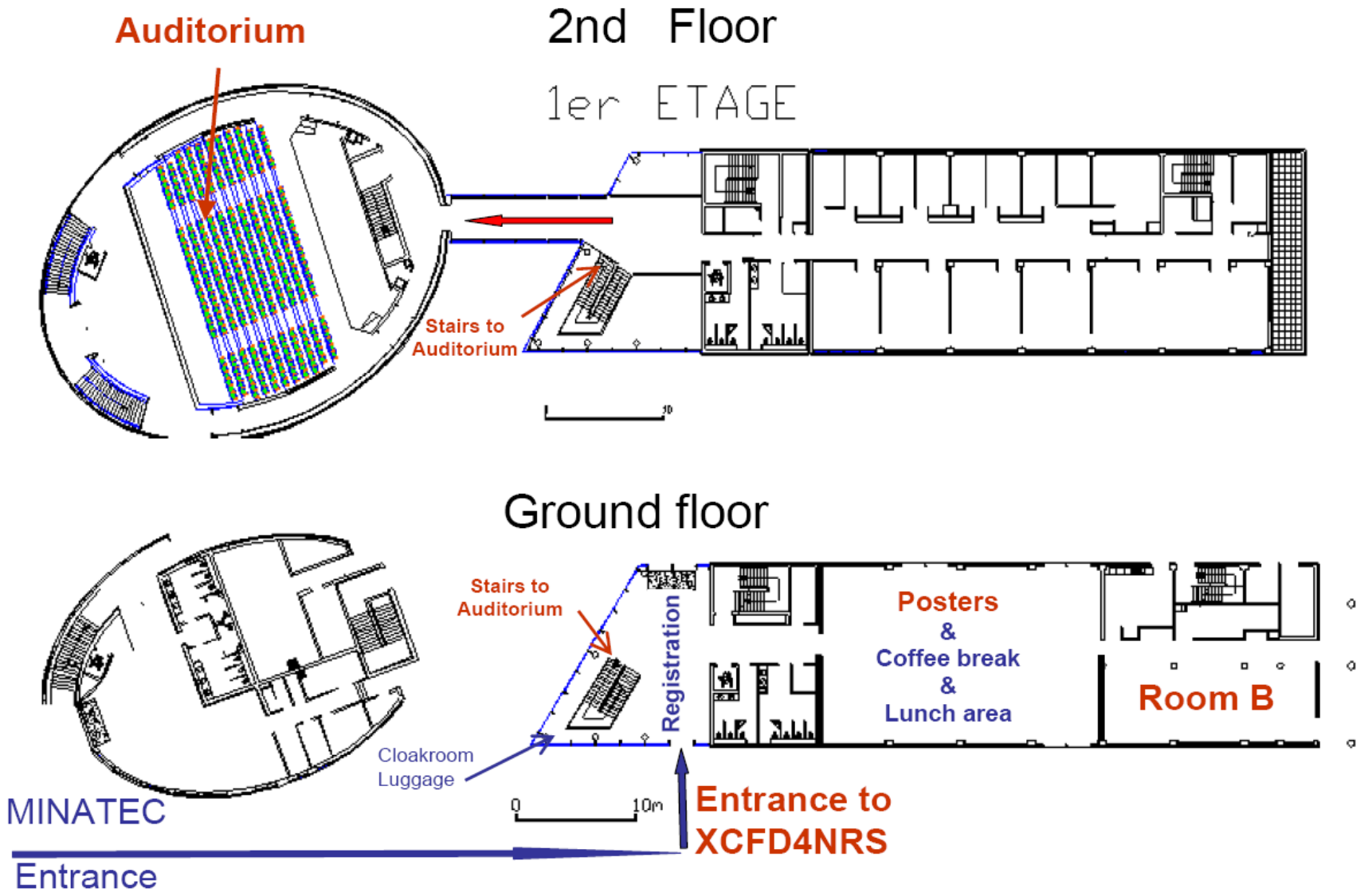
08.00 – 09.30	**Registration**	
	Auditorium	
09.00 – 09.30	Opening Remarks Welcoming Address: CEA-Grenoble ***D. Grand*** CEA-DEN-DSOE: ***C. Chauliac***	
09.30 – 10.10	**Keynote Lecture: V. Teschendorf , *The Role of CFD in NPP Safety***	
10.10 – 10.40	**Coffee Break**	
10.40 – 12.10	**Keynote Lectures: Summary of WG1, WG2 & WG3** **J.H. Mahaffy, *Best Practice Guidelines for the use of CFD for NRS applications*** **B. Smith, *Assessment of CFD for NRS*** **D. Bestion, *Extension of CFD use to 2-phase NRS issues***	
12.10 – 13.40	**Lunch**	
	Auditorium	**Room B**
13.40 – 15.20	***Session HOR***: HOR-01; HOR-02, HOR-03, HOR-04	***Session AC:*** AC-01, AC-02, AC-03, AC-04
15.20 – 15.50	**Coffee Break + *Poster Session***	
15.50 – 17.30	***Session PTS:*** PTS-01, PTS-02, PTS-03, PTS-04	***Session MIX*: :** MIX-01, MIX-02, MIX-03, MIX-04
17.30	**Adjourn**	

Second Day, Thursday, September 11

	Auditorium	**Room B**
08.30 – 09.15	**Keynote Lecture: Y. Hassan, *Single Phase CFD Simulation and Experimental Validation for Advanced Nuclear System Components***	
09.15 – 10.30	***Session BOI***: BOI-01, BOI-02, BOI-03	***Session CO***: CO-01, CO-02, CO-03
10.30– 11.00	**Coffee Break + *Poster Session***	
11.00 – 11.45	**Keynote Lecture: T. Hibiki, *Modeling and Measurement of Interfacial Area Concentration in Two-phase Flow***	
11.45 – 12.35	***Session BOI***: BOI-04, BOI-05	***Session CO***: CO-04, CO-05
12.35 – 14.00	**Lunch**	
14.00– 14.45	**Keynote Lecture: S. Banerjee *Advanced fine scale modelling of two-phase flow***	
14.45 – 16.25	***Session MS***: MS-01, MS-02, MS-03, MS-04	***Session MIX*: :** MIX-05, MIX-06, MIX-07, MIX-08
16.25 – 16.55	**Coffee Break + *Poster Session***	
16.55 – 17.45	***Session BOI***: BOI-06, BOI-07	***Session CSG***: CSG-01, CSG-02
17.45	**Adjourn**	
20.00	**Dinner**	

Third Day, Friday, September 12

	Auditorium	**Room B**
08.30 – 09.15	**Keynote Lecture: T. Schulenberg, *Experimental Techniques for Heavy Liquid Metals***	
09.15 – 10.30	***Session BOI***: BOI-08, BOI-09, BOI-10	***Session AR***: AR-01, AR-02, AR-03
10.30 – 11.00	**Coffee Break + *Poster Session***	
11.00 – 12.20	***Panel Session: Conclusions***	
12.20 – 14.00	**Lunch**	
End of Workshop		
14.00 – 16.30	Visit to CEA thermalhydraulic experimental facilities	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XCFD4NRS

FIRST DAY, WEDNESDAY, SEPTEMBER 10

08.00 – 09.30	**Registration**	
	Auditorium	
09.00 – 09.30	Opening Remarks Welcoming Address: CEA-Grenoble ***D. Grand*** CEA-DEN-DSOE: ***C. Chauliac***	
09.30 – 10.10	**Keynote Lecture: V. Teschendorf , *The Role of CFD in NPP Safety***	
10.10 – 10.40	**Coffee Break**	
10.40 – 12.10	**Keynote Lectures: Summary of WG1, WG2 & WG3** **J.H. Mahaffy, *Best Practice Guidelines for the use of CFD for NRS applications*** **B. Smith, *Assessment of CFD for NRS*** **D. Bestion, *Extension of CFD use to 2-phase NRS issues***	
12.10 – 13.40	**Lunch**	
	Auditorium	**Room B**
13.40 – 15.20	***Session HOR***: HOR-01; HOR-02, HOR-03, HOR-04	***Session AC:*** AC-01, AC-02, AC-03, AC-04
15.20 – 15.50	**Coffee Break** + ***Poster Session***	
15.50 – 17.30	***Session PTS:*** PTS-01, PTS-02, PTS-03, PTS-04	***Session MIX*: :** MIX-01, MIX-02, MIX-03, MIX-04
17.30	**Adjourn**	

SESSION HOR: HORIZONTAL FLOW - PIPE FLOW

Chairmen: Chul-Hwa Song, T. Watanabe

Oral presentations:

HOR-01: *Modeling free surface flows relevant to a PTS scenario: comparison between experimental data and three RANS based CFD-codes. Comments on the CFD-experiment integration and Best Practice Guideline*, by Y. Bartosiewicz, J.-M. Seynhaeve, C. Vallée, T. Höhne, J.M. Laviéville

HOR-02: Nuclear *Magnetic Resonance: a new tool for the validation of multi-phase multi-dimensional CFD codes*, by H. Lemonnier

HOR-03*: Experimental investigation of stratification phenomena in horizontal two-phase flows for CFD validation*, by M. Marchand, M. Bottin, J.P. Berlandis, E. Hervieu

HOR-04: Numerical *modelling of direct contact condensation in transition from stratified to slug flow*, by L. Štrubelj, I. Tiselj

Poster

HOR-05: *Experimental CCFD grade data for stratified two-phase flows*, by C. Vallée, D. Lucas, M. Beyer, H. Pietruske, P. Schütz, H. Car

SESSION AC: ACCIDENT ANALYSIS

Chairmen: N. Seiler, T. Morii

Oral presentations:

AC-01*: Experiments and CFD-modelling of insulation debris transport phenomena in water flow*, E. Krepper, G. Cartland-Glover, A. Grahn, F.P. Weiss

AC-02: *Fluid-structure interaction analysis of Large-Break Loss of Coolant Accident*, by T. Brandt, V. Lestinen, T. Toppila, J. Kähkönen, A. Timperi, T. Pättikangas, I. Karppinen

AC-03: *Simulation of a gas jet entering a failed steam generator during a SGTR sequence: validation of a FLUENT 6.2 model*, by C. López del Prá, F. J. S. Velasco, L. E. Herranz

AC-04: An *approach to numerical simulation and analysis of molten corium coolability in a BWR lower head*, by C. T. Tran, P. Kudinov and T. N. Dinh

Posters

AC-05: *Debris transport analysis related with GSI-191 in advanced Pressurized water reactor equipped with containment refuelling water storage tank*, by Jeong Ik Lee, Soon Joon Hong, Jonguk Kim, Byung Chul Lee, Young Seok Bang, Deog Yeon Oh, and Byung Gil Huh

AC-06: *Data obtained at high coolant parameters suitable for validation of 3D models*, by B.A. Gabaraev, E.K. Karasyov, O.Yu. Novoselsky, S.Z. Lutovinov, L.K. Tikhonenko, Ye.I. Trubkin, A.V. Shishov

FIRST DAY, WEDNESDAY, SEPTEMBER 10

SESSION PTS: PRESSURIZED THERMAL SHOCK - DIRECT CONTACT CONDENSATION

Chairmen: M. Scheuerer, M. Andreani

Oral presentations:

PTS-01: *Status of a two-phase CFD approach to the PTS issue*, by P. Coste, J. Pouvreau, J. Laviéville, M. Boucker

PTS-02*: FLUENT analysis of a ROSA cold leg stratification*, by T. Farkas, I. Tóth

PTS-03: *CFD analysis of a turbulent jet behaviour induced by a steam jet discharge through a single hole in a subcooled water pool*, by Hyung Seok Kang, Young-June Youn and Chul-Hwa Song

PTS-04: *PIV measurement of turbulent jet and pool mixing produced by a steam jet in a subcooled water pool*, by Yeon Jun CHOO, Chul Hwa SONG and Young Jung YOUN

Posters

PTS-05: *On the modelling of bubble entrainment by impinging jets in CFD simulations*, by M. Schmidtke, D. Lucas

PTS-06: *Validation of Direct Contact Condensation CFD models against condensation pool experiment*, by V. Tanskanen, D. Lakehal, M. Puustinen

SESSION MIX: MIXING ISSUES

Chairmen: B. Smith & D. Lucas

Oral presentations:

MIX-01*: Primary Loop Study of a VVER-1000 Reactor with special Focus on Coolant Mixing*, by M. Böttcher

MIX-02: *Experimental studies and CFD calculations for buoyancy driven mixing phenomena*, by M. J. da Silva, S. Thiele, T. Höhne, R. Vaibar, U. Hampel

MIX-03: *Experiments on slug mixing under natural circulation conditions at the ROCOM test facility using high resolution measurement technique and numerical modelling*, by S. Kliem, T. Höhne, U. Rohde, F.-P. Weiss

MIX-04: *Verification and validation considerations regarding the qualification of numerical schemes for LES dilution problems*, by F. Ducros, U. Bieder, O. Cioni, T. Fortin, B. Fournier, P. Quéméré

Posters

MIX-09*: Validation of CFD code ANSYS CFX against experiments with saline slug mixing performed at the Gidropress 4-loop WWER-1000 test facility*, by M. Bykov, A. Moskalev, A. Shishov, O. Kudryavtsev, D. Posysaev

MIX-10*: Validation of CFD code ANSYS CFX against experiments with asymmetric saline injection performed at the Gidropress 4-loop WWER-1000 test facility* , by M. Bykov, A. Moskalev, D. Posysaev, O. Kudryavtsev, A. Shishov

SECOND DAY, THURSDAY, SEPTEMBER 11

	Auditorium	Room B
08.30 – 09.15	**Keynote Lecture: Y. Hassan,** ***Single Phase CFD Simulation and Experimental Validation for Advanced Nuclear System Components***	
09.15 – 10.30	***Session BOI***: BOI-01, BOI-02, BOI-03	***Session CO***: CO-01, CO-02, CO-03
10.30– 11.00	**Coffee Break** + ***Poster Session***	
11.00 – 11.45	**Keynote Lecture: T. Hibiki,** ***Modeling and Measurement of Interfacial Area Concentration in Two-phase Flow***	
11.45 – 12.35	***Session BOI***: BOI-04, BOI-05	***Session CO***: CO-04, CO-05
12.35 – 14.00	**Lunch**	
14.00– 14.45	**Keynote Lecture: S. Banerjee** ***Advanced fine scale modelling of two-phase flow***	
14.45 – 16.25	***Session MS***: MS-01, MS-02, MS-03, MS-04	***Session MIX***: **:** MIX-05, MIX-06, MIX-07, MIX-08
16.25 – 16.55	**Coffee Break** + ***Poster Session***	
16.55 – 17.45	***Session BOI***: BOI-06, BOI-07	***Session CSG***: CSG-01, CSG-02
17.45	**Adjourn**	
20.00	**Dinner**	

SESSION BOI: BOILING FLOW, BUBBLY FLOW AND CRITICAL HEAT FLUX

Chairmen: E. Hervieu, M. Henriksson

Oral presentations:

BOI-01: *Benchmark database on the evolution of two-phase flows in a vertical pipe*, by D. Lucas, M. Beyer, J. Kussin, P. Schütz

BOI-02: *Characteristics of local bubble parameters of subcooled boiling flow in an annulus*, by B.J. Yun, B.U.Bae, W.M.Park, D.J.Euh, G.C.Park, C-.H. Song

BOI-03: *Wall-to-fluid heat transfer mechanisms in boiling flows*, by B. Končar, B. Mavko

BOI-04*: Development of two-phase flow CFD code (EAGLE) with interfacial area transport equation for analysis of subcooled boiling flow*, by B.U. Bae, B.J. Yun, H.Y. Yoon, G.C. Park, C.-H. Song

BOI-05: *A second order turbulence model based on a Reynolds Stress approach for two-phase boiling flow and application to fuel assembly analysis*, by S. Mimouni, F. Archambeau, M. Boucker, J. Lavieville, C. Morel

BOI-06: *Void measurement in Boiling Water Reactor rod bundles using high resolution gamma ray Tomography*, by A. Bieberle, D. Hoppe, C. Zippe, E. Schleicher, M. Tschofen, T. Suehnel, W. Zimmermann, U. Hampel

BOI-07: *CFD validation of film flows by novel high speed liquid film sensor with high spatial resolution*, by M. Damsohn, H.-M. Prasser

Poster:

BOI-11: *Simulation of critical heat flux experiments in NEPTUNE_CFD code*, by J. Macek, L. Vyskocil

SESSION MS: MULTI-SCALE ANALYSIS

Chairmen: D Bestion, Y. Hassan

Oral presentations:

MS-01*: Study of algorithmic requirements for a system-to-CFD coupling Strategy*, F. Cadinu, T. Kozlowski, P. Kudinov

MS-02: *Towards a multi-scale approach of two-phase flow modelling in the context of DNB modelling*, D. Jamet, O. Lebaigue, C. Morel, and B. Arcen

MS-03: *LEIS for the prediction of turbulent multi-fluid flows with and without phase change applied to thermal-hydraulics*, by D. Lakehal

MS-04: *Assessment against DNS data of a coupled CFD-stochastic model for particle dispersion in turbulent channel flows*, by A. Dehbi

SECOND DAY, THURSDAY, SEPTEMBER 11

SESSION CO: CONTAINMENT THERMAL-HYDRAULICS Chairmen: J. Mahaffy, E Graffard

Oral presentations:

CO-01: *Modelling of sprays in containment applications with A CMFD code*, by S. Mimouni, J-S. Lamy, J. Lavieville, S. Guieu, M. Martin

CO-02: *GASFLOW validation with Panda tests from the OECD SETH Benchmark covering steam/air and steam/helium/air mixtures*, P. Royl, J.R. Travis, W. Breitung, Jongtae Kim, Sang Baik Kim,

CO-03: *New PANDA instrumentation for assessing gas concentration distributions in Containment Compartments*, M. Ritterath, H.-M. Prasser, D. Paladino, N. Mitric

CO-04: *On the unexpectedly large effect of re-vaporization of the condensate liquid film in two tests in the PANDA facility revealed by simulations with the GOTHIC code*, by M. Andreani, D. Paladino, T. George

CO-05: *Validation of CFD for Containment Jet Flows including Condensation*, by M. Heitsch, D. Baraldi, H. Wilkening

Posters:

CO-06: *Operational behaviour of catalytic recombiners - experimental results and modelling approaches*, , by S. Kelm, W. Jahn, E.A Reinecke

CO-07*: Effects of spray modes on Hydrogen risk in a Chinese NPP*, by Jinbiao Xiong, Yanhua Yang, Xu Cheng

SESSION MIX: MIXING ISSUES Chairmen: B. Smith & D. Lucas

Oral presentations:

MIX-05: *CFD Study on Coolant Mixing in VVER-440 Fuel rod bundle and fuel Assembly Head*, S. Tóth, A. Aszódi

MIX-06: *Fluid mixing at a T-junction*, H.-M. Prasser, A. Manera, B. Niceno, M. Simiano, B. Smith, C. Walker, R. Zboray

MIX-07: *Simulation of turbulent and thermal mixing in T-junctions using URANS and Scale-resolving turbulence models in ANSYS-CFX*, by Th. Frank, M. Adlakha, C. Lifante, H.-M. Prasser, F. Menter

MIX-08: *Large Eddy Simulation of turbulent mixing in a T-junction*, A.K. Kuczaj, E.M.J. Komen

Posters

MIX-09*: Validation of CFD code ANSYS CFX against experiments with saline slug mixing performed at the Gidropress 4-loop WWER-1000 test facility*, by M. Bykov, A. Moskalev, A. Shishov, O. Kudryavtsev, D. Posysaev

MIX-10*: Validation of CFD code ANSYS CFX against experiments with asymmetric saline injection performed at the Gidropress 4-loop WWER-1000 test facility* , by M. Bykov, A. Moskalev, D. Posysaev, O. Kudryavtsev, A. Shishov

SESSION CSG: CORE AND STEAM GENERATORS Chairmen: M. Andreani, F. Moretti

Oral presentations:

CSG-01*: CFD methodology and validation for single-phase flow in PWR fuel assemblies*, by M. E. Conner, E. Baglietto, A.M. Elmahdi

CSG-02: *Experimental investigation of coolant mixing in VVER reactor fuel bundles by particle image velocimetry*, by D. Tar, G. Baranyai, Gy. Ézsol, I. Tóth

Posters:

CSG-03: *Cross-verification of one- and three-dimensional models for VVER steam generator*, by K.S. Dolganov, A.V. Shishov

CSG-04*: Experimental and numerical approach to validate pressure loss predictability of a commercial code*, by T. Ikeno and S. Kakinoki

CSG-05: *Development of a 3D model of tube bundle of VVER reactor steam generator* by V.F. Strizhov, M.A. Bykov, A.Ye. Kiselev A.V. Shishov, A.A. Krutikov, D.A. Posysaev, D.A. Mustafina

THIRD DAY, FRIDAY, SEPTEMBER 12

	Auditorium	Room B
08.30 – 09.15	**Keynote Lecture: T. Schulenberg, *Experimental Techniques for Heavy Liquid Metals***	
09.15 – 10.30	***Session BOI*: BOI-08, BOI-09, BOI-10**	***Session AR*: AR-01, AR-02, AR-03**
10.30 – 11.00	**Coffee Break + *Poster Session***	
11.00 – 12.20	***Panel Session: Conclusions***	
12.20 – 14.00	**Lunch**	
End of Workshop		
14.00 – 16.30	Visit to CEA thermalhydraulic experimental facilities	

SESSION BOI: BOILING FLOW, BUBBLY FLOW AND CRITICAL HEAT FLUX,
Chairmen: E. Hervieu, M. Henriksson

Oral presentations:

BOI-08: *Ultra fast electron beam X-ray computed tomography for two-phase flow measurement*, by F. Fischer, U. Hampel

BOI-09: *CFD code validation and benchmarking against BFBT boiling flow experiment*, by M. C. Galassi, F. Moretti, F. D'Auria

BOI-10: *Boiling Flow Simulation in NEPTUNE_CFD and FLUENT Codes*, by L. Vyskocil, J. Macek

Poster:

BOI-11*: Simulation of critical heat flux experiments in NEPTUNE_CFD code*, by J. Macek, L. Vyskocil

SESSION AR: ADVANCED REACTORS Chairmen: T. Schulenberg, F. Ducros

Oral presentations:

AR-01: *A CFD M&S Process for fast reactor fuel assemblies*, by K. D. Hamman and R. A. Berry

AR-02*: Development and validation of high-precision CFD method with Volume-Tracking algorithm for gas-liquid two-phase flow simulation on unstructured mesh*, by I1. Kei Ito, T. Kunugi,. H. Ohshima

AR-03: *Idaho National Laboratory Program to Obtain Benchmark Data on the Flow Phenomena in a Scaled Model of a Prismatic Gas-Cooled Reactor Lower Plenum for the Validation of CFD Codes?* By H. M. McIlroy, D. M. McEligot,∗ and R. J. Pink

Posters:

AR-04: *Experimental approach to flow field evaluation in upper plenum of reactor vessel for innovative sodium cooled fast reactor*, by N. Kimura, K. Hayashi, H. Kamide

AR-05: *Validation by Experiments for gas entrainment studies in 5/8 surge tank model of PFBR*, by D.Ramdasu, N.S. Shivakumar, G. Padmakumar, C. AnandBabu, G. Vaidyanathan, S. Rammohan, S.K Sreekala, S. Manikandan, S. Saseendran