

ERCOFTAC WORKSHOP

Direct and Large-Eddy Simulation 9

Dresden, Germany, April 2 – 5, 2013

DETAILED PROGRAM (15 MARCH 2013)

Tuesday, April 2

	Room K6	Room K5	Room K3
17.30 – 19.30	EARLY REGISTRATION AND WELCOME RECEPTION		

Wednesday, April 3

	Room K6	Room K5	Room K3
8.00 – 8.50	REGISTRATION		
8.50 – 9.10	WELCOME		
9.10 – 10.30	KEYNOTE LECTURES Session Chair: B.J. Geurts		
9.10 – 9.50	INVESTIGATIONS OF STABILITY AND TRANSITION OF A JET IN CROSSFLOW USING DNS D. Henningson		
9.50 – 10.30	DNS AND LES OF TWO-PHASE FLOWS WITH CAVITATION S. Hickel		
10.30 – 10.50	COFFEE BREAK		
10.50 – 12.30	LES MODELLING I Session Chair: D. Thévenin	MULTIPHASE I Session Chair: A. Soldati	
10.50 – 11.10	NUMERICAL EXPERIMENTS WITH A NEW DYNAMIC MIXED SUBGRID-SCALE MODEL P. Lampitella, F. Inzoli, E. Colombo	FOUR-WAY COUPLED LES PREDICTIONS OF DENSE PARTICLE-LADEN FLOWS IN HORIZONTAL SMOOTH AND ROUGH PIPES M. Alletto, M. Breuer	
11.10 – 11.30	IMPLICIT LARGE-EDDY SIMULATION OF ISOTROPIC TURBULENT MIXING F.F. Grinstein, A.J. Wachtor, J.R. Ristorcelli, C.R. DeVore	BIOMASS PYROLYSIS IN DNS OF TURBULENT PARTICLE-LADEN FLOW E. Russo, J.G.M. Kuerten, B.J. Geurts	

	Room K6	Room K5	Room K3
11.30 – 11.50	NEW DIFFERENTIAL OPERATORS FOR LARGE-EDDY SIMULATION AND REGULARIZATION MODELING <u>F.X. Trias</u> , A. Gorobets, A. Oliva, R.W.C.P. Verstappen	MODULATION OF ISOTROPIC TURBULENCE BY RESOLVED AND NON-RESOLVED SPHERICAL PARTICLES <u>A.H. Abdelsamie</u> , D. Thévenin	
11.50 – 12.10	ASSESSMENT OF IMPLICIT SUBGRID-SCALE MODELING FOR TURBULENT SUPERCRITICAL MIXING <u>C.A. Niedermeier</u> , S. Hickel, N.A. Adams	A HYBRID DECONVOLUTION-STOCHASTIC MODEL FOR LES OF PARTICLE-LADEN FLOW <u>W.R. Michalek</u> , <u>J.G.M. Kuerten</u> , R. Liew, J.C.H. Zeegers, J. Pozorski, B.J. Geurts	
12.10 – 12.30	Poster Talks LES Modelling (3 min each) A COMPARISON OF INFLOW GENERATION METHODS FOR LARGE-EDDY SIMULATION <u>F.T. Pronk</u> , S.J. Hulshoff POOR MAN'S LES – LATTICE BOLTZMANN BASED LARGE EDDY SIMULATION EMBEDDED INTO CLASSICAL CFD S. Pirker, <u>P. Seil</u> DESIGN OF HIGH-ORDER IMPLICIT FILTERS ON UNSTRUCTURED GRIDS FOR THE IDENTIFICATION OF LARGE-SCALE FEATURES IN LARGE-EDDY SIMULATIONS <u>L. Guedot</u> , G. Lartigue, V. Moureau FORCED MAGNETOHYDRODYNAMIC TURBULENCE IN LARGE EDDY SIMULATION OF COMPRESSIBLE FLUID A.A. Chernyshov, K.V. Karelsky, <u>A.S. Petrosyan</u> A SUBGRID-SCALE MODEL DRIVEN BY DNS DATA <u>S. Hoßbach</u> , J.J. Peña Fernández, J.L. Sesterhenn	Poster Talks Multiphase & FSI (3 min each) LES OF THE RANQUE-HILSCH VORTEX TUBE <u>W.R. Michalek</u> , <u>J.G.M. Kuerten</u> , R. Liew, J.C.H. Zeegers DIRECT NUMERICAL SIMULATION OF HEAT TRANSFER IN COLLIDING DROPLETS BY A COUPLED LEVEL SET AND VOLUME OF FLUID METHOD <u>N. Talebanfard</u> , B.J. Boersma CALCULATION OF FLOW PAST STATIONARY AND VIBRATING CIRCULAR CYLINDER AT RE=3900 M.C. Kara, M. Cevheri, S. Kara, <u>Th. Stoesser</u> ON THE NUMERICAL MODELING OF ACTIVE FLOW CONTROL FOR AERODYNAMICS APPLICATIONS AND ITS IMPACT ON THE PRESSURE FIELD <u>M. El-Alti</u> , P. Kjellgren, L. Davidson DIRECT NUMERICAL SIMULATION OF IMMISCIBLE RAYLEIGH-TAYLOR TURBULENCE <u>F. Yu</u> , X. Hu, S. Hickel, N.A. Adams	
12.30 – 13.25	LUNCH		
13.25 – 14.05	KEYNOTE LECTURE Session Chair: V. Armenio		
13.25 – 14.05	IMPACTS OF SURFACE WAVES ON MARINE BOUNDARY LAYERS: LARGE EDDY SIMULATION RESULTS P.P. Sullivan		
14.10 – 15.30	ENVIRONMENTAL I Session Chair: J.Stiller	TURBULENCE I Session Chair: D.Henningson	
14.10 – 14.30	SIMULATION OF BREAKING ATMOSPHERIC GRAVITY WAVES <u>S. Remmler</u> , S. Hickel	VERY LARGE SCALE MOTIONS IN THE DIRECT NUMERICAL SIMULATION OF TURBULENT PIPE FLOW <u>B.J. Boersma</u>	

	Room K6	Room K5	Room K3
14.30 – 14.50	DNS OF A RADIATIVELY DRIVEN CLOUD-TOP MIXING LAYER AS A MODEL FOR STRATOCUMULUS CLOUDS <u>A. de Lózar</u> , J.P. Mellado	ASSESSMENT OF DIRECT NUMERICAL SIMULATION DATA OF TURBULENT PIPE FLOWS G.K. El Khoury, <u>Ph. Schlatter</u> , A. Noorani, G. Brethouwer, A.V. Johansson	
14.50 – 15.10	EFFECT OF EKMAN LAYER ON WINDFARM ROUGHNESS AND DISPLACEMENT HEIGHT <u>J.P. Goit</u> , J. Meyers	DIRECT NUMERICAL SIMULATIONS OF OSCILLATORY PIPE FLOWS <u>C. Wagner</u> , D. Feldmann	
15.10 – 15.30	Poster Talks Environmental (3 min each) DIRECT AND LARGE-EDDY SIMULATION OF NON-OBERBECK-BOUSSINESQ EFFECTS IN A TURBULENT DIFFERENTIALLY HEATED CAVITY <u>D. Kizildag</u> , F.X. Trias, I. Rodríguez, A.Oliva LARGE-EDDY SIMULATION OF WIND FLOWS AND POLLUTANT TRANSPORTS INSIDE AND ABOVE IDEALIZED URBAN STREET CANYONS UNDER UNSTABLE THERMAL STRATIFICATION <u>M.-C. Chan</u> , C.-H. Liu CONVECTION IN A STRATIFIED ATMOSPHERE: FROM ISOLATED PLUMES TO THE CONVECTIVE BOUNDARY LAYER <u>C.C. van Heerwaarden</u> , J.P. Mellado WIND-WAVE INTERACTION STUDIES BASED ON LES <u>A. AlSam</u> , J. Revstedt, R.Z. Szasz LARGE-EDDY SIMULATION OF TURBULENT FLOW OVER AN ARRAY OF WALL-MOUNTED CUBIC OBSTACLES <u>M. Saeedj</u> , B.-C. Wang DIRECT NUMERICAL SIMULATION OF THE 3D STRATIFIED SEPARATED VISCOUS FLUID FLOWS <u>P.V. Matyushin</u> , V.A. Gushchin	Poster Talks Transition & Turbulence (3 min each) SEPARATED FLOW TRANSITION UNDER FREE-STREAM TURBULENCE <u>M. Langari</u> , Z. Yang ON THE LARGE-EDDY SIMULATIONS OF THE FLOW PAST A CYLINDER AT CRITICAL REYNOLDS NUMBERS <u>O. Lehmkuhl</u> , I. Rodríguez, J. Chiva, R. Borrell LARGE EDDY SIMULATION OF FLUIDIC INJECTION INTO SUPERSONIC CONVERGENT-DIVERGENT DUCT <u>B. Semlitsch</u> , M. Mihaescu, L. Fuchs	
15.30 – 16.10	COFFEE & POSTERS		
16.10 – 17.40	NUMERICS I Session Chair: R. Verstappen	REACTIVE FLOWS & COMBUSTION I Session Chair: H. Pitsch	
16.10 – 16.30	DIRECT NUMERICAL SIMULATION OF CANONICAL FLOWS USING THE MODAL DISCONTINUOUS GALERKIN METHOD <u>J.-B. Chapelier</u> , M. De La Llave Plata, F. Renac, E. Lamballais	LES OF TURBULENCE-RADIATION INTERACTION IN PLANE REACTING AND INERT MIXING LAYERS <u>S. Ghosh</u> , R. Friedrich, Ch. Stemmer	
16.30 – 16.50	LES USING A DISCONTINUOUS GALERKIN METHOD: ISOTROPIC TURBULENCE, CHANNEL FLOW AND PERIODIC HILL FLOW <u>C. Carton de Wiart</u> , K. Hillewaert, L. Bricteux, G. Winckelmans	A PRIORI ANALYSIS OF DYNAMIC MODELS FOR LARGE EDDY SIMULATIONS OF TURBULENT PREMIXED COMBUSTION <u>D. Veynante</u> , V. Moureau, M. Boileau, T. Schmitt	

	Room K6	Room K5	Room K3
16.50 – 17.10	<p>UNDERRESOLVED TURBULENCE SIMULATIONS WITH STABILIZED HIGH-ORDER DISCONTINUOUS GALERKIN METHODS <u>A.D. Beck</u>, G.J. Gassner, C.D. Munz</p>	<p>LAGRANGIAN ANALYSIS OF MIXING AND SOOT TRANSPORT IN A TURBULENT JET FLAME <u>A. Attili</u>, F. Bisetti, M.E. Mueller, H. Pitsch</p>	
17.10 – 17.30	<p>A NEW HIGH ORDER METHOD FOR THE ACCURATE SIMULATION OF INCOMPRESSIBLE WALL-BOUNDED FLOWS <u>P. Lenaers</u>, Ph. Schlatter, G. Brethouwer, A. Johansson</p>	<p>THE INFLUENCE OF DIFFERENTIAL DIFFUSION IN TURBULENT OXYGEN ENHANCED METHANE FLAMES <u>F. Dietzsch</u>, G. Fru, D. Thévenin, C. Hasse</p>	
17.30 – 17.40	<p>Poster Talks Numerics (3 min each)</p> <p>DIRECT NUMERICAL SIMULATION OF SQUARE-CYLINDER FLOW USING HYBRID WAVELET-COLLOCATION/VOLUME-PENALIZATION METHOD <u>G. De Stefano</u>, O.V. Vasilyev</p> <p>GENERATION OF INTERMITTENT TURBULENT INFLOW AND INITIAL CONDITIONS BASED ON A WAVELET CONSTRUCTION METHOD <u>L. Zhou</u>, J. Grilliat, A. Delgado</p>	<p>Poster Talks Combustion (3 min each)</p> <p>LES OF PRE-VAPORIZED N-HEPTANE AUTOIGNITION WITH TABULATED CHEMISTRY AND STOCHASTIC FIELDS COMBUSTION MODEL <u>R. Kulkarni</u>, W. Polifke</p>	

Thursday, April 4

	Room K6	Room K5	Room K3
8.30 – 9.50	KEYNOTE LECTURES Session Chair: H. Kuerten		
8.30 – 9.10	WHY YOU NEED LES FOR PREDICTING SOOT EMISSIONS IN TURBULENT COMBUSTION H. Pitsch		
9.10 – 9.50	ON SCALE SEPARATION IN LARGE EDDY SIMULATIONS R. Verstappen		
9.50 – 10.20	COFFEE & POSTERS		
10.20 – 12.00	TURBULENCE II Session Chair: Ph. Schlatter	COMPRESSIBLE FLOWS Session Chair: M.V. Salvetti	REACTIVE FLOWS & COMBUSTION II Session Chair: D. Veynante
10.20 – 10.40	LARGE-EDDY SIMULATION OF WALL JETS WITH AN EXTERNAL STREAM <u>I.Z. Naqavi</u> , P.G. Tucker	MACH NUMBER INFLUENCE ON VORTEX BREAKDOWN IN SUBSONIC SWIRLING NOZZLE-JET FLOWS <u>T. Luginsland</u> , L. Kleiser	APPLICATION OF FLAMELET GENERATED MANIFOLDS APPROACH WITH HEAT LOSS INCLUSION TO A TURBULENT HIGH-PRESSURE PREMIXED CONFINED JET FLAME <u>A. Donini</u> , S.M. Martin, R.J.M. Bastiaans, J.A. van Oijen, L.P.H. de Goey
10.40 – 11.00	TURBULENT BOUNDARY LAYERS IN LONG COMPUTATIONAL DOMAINS Ph. Schlatter, <u>G. Eitel-Amor</u>	A SYMMETRY-PRESERVING DISCRETIZATION AND REGULARIZATION SUBGRID MODEL FOR COMPRESSIBLE TURBULENT FLOW <u>W. Rozema</u> , R.W.C.P. Verstappen, A.E.P. Veldman, J.C. Kok	DIRECT NUMERICAL SIMULATIONS OF TURBULENT H ₂ -AIR PRE-MIXTURES <u>G. Fru</u> , D. Thévenin, D. Markus
11.00 – 11.20	LES AND LDV ANALYSIS OF THE COHERENT STRUCTURES IN THE NEAR WAKE OF A SQUARE CYLINDER <u>E. Serre</u> , M. Minguez, C. Brun, R. Pasquetti	COMPARISON OF ACOUSTIC PROPERTIES IN DNS OF A SUPERSONIC JET WITH THREE DIFFERENT INLET BOUNDARY CONDITIONS <u>J.J. Peña Fernández</u> , S. Hoßbach, J.L. Sesterhenn	LARGE EDDY SIMULATION OF HIGH FREQUENCY FLAME DYNAMICS IN PERFECT PREMIX COMBUSTORS WITH ELEVATED INLET TEMPERATURES <u>M. Zellhuber</u> , W. Polifke
11.20 – 11.40	INVESTIGATION OF DUAL-SOURCE PLUME INTERACTION IN A TURBULENT WALL-BOUNDED SHEAR LAYER <u>S.N. Oskouie</u> , B.-C. Wang, E. Yee	IMPLICIT LES OF A SONIC JET IN A SUPERSONIC CROSSFLOW <u>S. Eberhardt</u> , S. Hickel	DIRECT NUMERICAL SIMULATION OF HYDROGEN-CARBON MONOXIDE TURBULENT PREMIXED FLAME <u>F. Battista</u> , F. Picano, G. Troiani, C.M. Casciola
11.40 – 12.00	LES OF THE FLOW IN A RIB-ROUGHENED DUCT <u>D. Borello</u> , A. Salvagni, F. Rispoli	IMPLICIT LES OF NOISE REDUCTION FOR A COMPRESSIBLE DEEP CAVITY USING PULSED NANOSECOND PLASMA ACTUATOR <u>Z.L. Chen</u> , B.Q. Zhang, S. Hickel, N.A. Adams	
12.00 – 12.55	LUNCH		
12.55 – 13.35	KEYNOTE LECTURE Session Chair: F. Stefani		
12.55 – 13.35	PETASCALE AND BEYOND IN SIMULATIONS OF GEOPHYSICAL AND ASTROPHYSICAL TURBULENCE A. Pouquet		

	Room K6	Room K5	Room K3
13.40 – 15.00	MHD Session Chair: A. Pouquet	AERODYNAMICS Session Chair: T. Colonius	NUMERICS II / STABILITY & TRANSITION Session Chair: N.N.
13.40 – 14.00	LINEAR INSTABILITY ANALYSIS OF 3D MAGNETOHYDRODYNAMIC FLOW BY DIRECT NUMERICAL SIMULATION <u>I. Grants</u> , G. Gerbeth	LARGE-EDDY SIMULATIONS FOR WIND TURBINE BLADE: ROTATIONAL AUGMENTATION AND DYNAMIC STALL <u>Y. Kim</u> , I.P. Castro, Z.T. Xie	CHARACTERISTIC-BASED VOLUME PENALIZATION METHOD FOR ARBITRARY MACH FLOWS AROUND SOLID OBSTACLES E. Brown-Dymkoski, N. Kasimov, <u>O. V. Vasilyev</u>
14.00 – 14.20	SPECTRAL/FINITE ELEMENT SOLVER FOR INCOMPRESSIBLE MAGNETOHYDRODYNAMIC FLOWS - APPLICATION TO DEVELOPED PIPE FLOW WITH TRANSVERSE MAGNETIC FIELD. <u>X. Dechamps</u> , M. Rasquin, G. Degrez	UNSTEADY CHARACTERISTIC OF STALL AROUND AIRFOIL BY QUASI-DNS <u>N. Alferez</u> , I. Mary, E. Lamballais	DNS OF A DOUBLE DIFFUSIVE INSTABILITY <u>J.G. Wissink</u> , H. Herlina, S.I. Voropayev, H.J.S. Fernando
14.20 – 14.40	ON TURBULENCE GENERATION AND MIXING IN THE WAKE OF MAGNETIC OBSTACLES: A DNS STUDY <u>S. Kenjeres</u>	COMPRESSIBLE DNS OF A LOW PRESSURE TURBINE SUBJECTED TO INLET DISTURBANCES <u>L. Chen</u> , R. Pichler, R.D. Sandberg	FLOW PAST A NACA0012: FROM LAMINAR SEPARATION BUBBLES TO FULLY STALLED REGIME <u>I. Rodríguez</u> , O. Lehmkuhl, R. Borrell, A. Oliva
14.40 – 15.00	SIMULATION OF INSTABILITIES IN LIQUID METAL BATTERIES <u>N. Weber</u> , V. Galindo, T. Weier, F. Stefani	LARGE EDDY SIMULATION OF NACA-0012 AIRFOIL NEAR STALL <u>J.H. Almutairi</u> , I.M. AlQadi	NUMERICAL SIMULATION OF A QUASI-TWO-DIMENSIONAL JET <u>R. Mullyadzhanov</u> , B. Ilyushin, M. Hadziabdic, K. Hanjalic
15.00 – 15.30	COFFEE & POSTERS		
15.30 – 17.10	ENVIRONMENTAL II Session Chair: P. Sullivan	MULTIPHASE II Session Chair: S. Hickel	ROTATING TURBULENCE Session Chair: E. Serre
15.30 – 15.50	ENERGY BUDGET ANALYSIS OVER TWO-DIMENSIONAL URBAN-LIKE IDEALIZED ROUGHNESS ELEMENTS WITH HEIGHT VARIATION <u>C.C.C. Wong</u> , Chun-Ho Liu	COMPARISON OF DNS OF COMPRESSIBLE AND INCOMPRESSIBLE TURBULENT DROPLET-LADEN HEATED CHANNEL FLOW WITH PHASE TRANSITION <u>A. Bukhvosova</u> , E. Russo, J.G.M. Kuerten, B.J. Geurts	EFFECTS OF ROTATION ON THE OSCILLATORY FLOW OVER RIPPLES <u>D.G.E. Grigoriadis</u> , V. Armenio
15.50 – 16.10	POLLUTANT DISPERSION IN THE URBAN BOUNDARY LAYER <u>J.M. Tomas</u> , M.J.B.M. Pourquie, G.E. Elsinga, H.E. Eisma, H.J.J. Jonker, J. Westerweel	DIRECT NUMERICAL SIMULATION OF A COMPRESSIBLE MULTIPHASE FLOW THROUGH THE FAST EULERIAN APPROACH M. Cerminara, <u>L.C. Berselli</u> , T. Esposti Ongaro, M.V. Salvetti	NUMERICAL SIMULATIONS OF A NARROW GAP TURBULENT TAYLOR-COUPETTE-POISEUILLE FLOW S. Viazzo, <u>S. Poncet</u> , R. Oguic
16.10 – 16.30	FRACTALITY OF TREES & INTERMITTENT CANOPY TURBULENCE IN LES <u>J. Schröttle</u> , S. Gisinger, A. Dörnbrack	DNS OF TURBULENT BUBBLY DOWNWARD FLOW IN A VERTICAL PLANE CHANNEL WITH A COUPLED LEVEL-SET/VOLUME-OF-FLUID METHOD M. Kwakkel, <u>W.-P. Breugem</u> , B.J. Boersma	ROTATION-MODULATED TURBULENT CONVECTIVE HEAT TRANSFER <u>B.J. Geurts</u> , R.P.J. Kunnen
16.30 – 16.50	LES OF A THREE-DIMENSIONALLY RESOLVED FOREST WITH TOPOGRAPHY <u>F. Schlegel</u> , J. Stiller, A. Bienert, H.-G. Maas, R. Queck, Ch. Bernhofer	EULERIAN AND LAGRANGIAN APPROACH TO MULTI-SCALE MODELING OF AEROSOL FORMATION <u>A.K. Kuczaj</u> , M. Nordlund, C. Winkelmann, I. Zinovik, L. Ghazaryan, B.J. Geurts	A FIRST APPROACH TO "NUMERICAL VON KARMAN" FLOW C. Jause-Labert, <u>F.S. Godeferd</u>
16.50 – 17.10	LARGE-EDDY SIMULATION MODEL FOR URBAN AREAS WITH THERMAL AND HUMID STRATIFICATION EFFECTS <u>A. Petronio</u> , F. Roman, V. Armenio, F. Stel, D. Giaiotti		EFFECT OF SPAN-WISE RESOLUTION FOR LES OF FLOW OVER A ROTATING CYLINDER AT HIGH REYNOLDS NUMBER <u>S. Rolfo</u> , A. Revell

19.00 **BUS TRANSFER TO CONFERENCE DINNER**

Friday, April 5

	Room K6	Room K5	Room K3
8.30 – 9.50	KEYNOTE LECTURES		
	Session Chair: J. Fröhlich		
8.30 – 9.10	COMPUTATION AND PHYSICS OF TURBULENT DISPERSED FLOWS A. Soldati		
9.10 – 9.50	SIMULATION AND MODELING OF TURBULENT JET NOISE T. Colonius		
9.50 – 10.20	COFFEE & POSTERS		
10.20 – 12.00	LES MODELLING II & HYBRID	MULTIPHASE III	
	Session Chair: D. Borello	Session Chair: W.-P. Breugem	
10.20 – 10.40	VALIDATION OF AN ENTROPY-VISCOSITY MODEL FOR LES J.-L. Guermond, <u>A. Larios</u> , P. Minev, T. Thompson	PARTICLE-LADEN TURBULENT CHANNEL FLOW WITH WALL-ROUGHNESS B. Milici, M. De Marchis, <u>G. Sardina</u> , E. Napoli	
10.40 – 11.00	A STOCHASTIC CLOSURE APPROACH TO LARGE EDDY SIMULATION WITH APPLICATION TO TURBULENT CHANNEL FLOW DNS DATA A. Beck, G. Gassner, I. Horenko, D. Igdalov, R. Klein, <u>Th. von Larcher</u> , Ph. Metzner, C.-D. Munz, M. Waidmann	DIRECT NUMERICAL SIMULATION OF BED-LOAD TRANSPORT OF FINITE-SIZE SPHERICAL PARTICLES IN A TURBULENT CHANNEL FLOW <u>B. Vowinckel</u> , T. Kempe, J. Fröhlich, V. Nikora	
11.00 – 11.20	COMPARISON OF URANS, PANS, LES AND DNS OF FLOWS AROUND SIMPLIFIED GROUND VEHICLES WITH FLOW CONTROL <u>S. Krajnovic</u> , X. Han, C.H. Bruneau, I. Mortazavi	DIRECT NUMERICAL SIMULATIONS ON SEDIMENTATION AND AGGLOMERATION OF POLYDISPERSE SPHERICAL PARTICLES <u>M. Ernst</u> , M. Dietzel, M. Sommerfeld	
11.20 – 11.40	HYBRID LES-URANS METHODOLOGY FOR WALL-BOUNDED FLOWS S. Schmidt, <u>M. Breuer</u>	LAMINAR AND TURBULENT FLOW ABOUT A SYSTEM OF MICRON-SIZED PARTICLES RANDOMLY DISTRIBUTED ON THE SURFACE OF LARGER CARRIER PARTICLES <u>Y. Cui</u> , M. Sommerfeld	
11.40 – 12.00	A DUAL-MESH HYBRID LES/RANS FRAMEWORK WITH IMPLICIT CONSISTENCY <u>H. Xiao</u> , P. Jenny	AN INHOMOGENEOUS STOCHASTIC SUBGRID SCALE MODEL FOR PARTICLE DISPERSION IN LARGE-EDDY SIMULATION <u>M. Knorps</u> , J. Pozorski	
12.00 – 12.55	LUNCH		
12.55 – 14.35	QUALITY OF LES	HEAT TRANSFER & NATURAL CONVECTION	
	Session Chair: J. Meyers	Session Chair: A. Giesecke	
12.55 – 13.15	INVESTIGATIONS ON THE EFFECT OF DIFFERENT SUBGRID MODELS ON THE QUALITY OF LES RESULTS <u>F. Proch</u> , M.W.A. Pettit, T. Ma, M. Rieth, A.M. Kempf	DNS OF THERMAL CONVECTION IN RECTANGULAR DOMAINS WITH DIFFERENT DEPTHS <u>S. Wagner</u> , O. Shishkina	
13.15 – 13.35	REYNOLDS SCALING OF SCALES AT VARIOUS TURBULENCE RESOLUTIONS <u>A.R. Nejadmalayeri</u> , O.V. Vasilyev, A. Vezolainen	DIRECT NUMERICAL SIMULATIONS OF ROTATING TURBULENT CHANNEL FLOW WITH HEAT TRANSFER <u>G. Brethouwer</u> , Ph. Schlatter, A.V. Johansson	

	Room K6	Room K5	Room K3
13.35 – 13.55	SIMULATION OF THE THERMALLY DRIVEN FLOW IN A ROTATING ANNULUS WITH ADAPTIVE MOVING GRIDS <u>C. Hertel</u> , E. Séverac, B. Krull, J. Fröhlich	DIRECT NUMERICAL SIMULATION OF LOW-MACH TURBULENT NATURAL CONVECTION FLOW IN AN OPEN CAVITY OF ASPECT RATIO 4 <u>J. Chiva</u> , O. Lehmkuhl, J. Ventosa, A. Oliva	
13.55 – 14.15	RELIABILITY OF LES SIMULATIONS IN THE CONTEXT OF A BENCHMARK ON THE AERODYNAMICS OF A RECTANGULAR 5:1 CYLINDER <u>M.V. Salvetti</u> , L. Bruno	DNS AND LES OF ROTATING RAYLEIGH-BENARD CONVECTION AT HIGH RAYLEIGH NUMBERS <u>S. Horn</u> , C. Wagner	
14.15 – 14.35	QUANTIFYING THE IMPACT OF SUBGRID SCALE MODELS IN ACTUATOR-LINE BASED LES OF WIND TURBINE WAKES <u>H. Sarlak</u> , C. Meneveau, J.N. Sørensen, R. Mikkelsen	LARGE-EDDY SIMULATIONS OF FLOW AND HEAT TRANSFER AROUND A LOW-MACH NUMBER BLADE <u>N. Maheu</u> , V. Moureau, P. Domingo	
14.35 – 14.55	COFFEE & POSTERS		
14.55 – 15.35	LES MODELLING III Session Chair: G. Grötzbach	FSI & FLOW CONTROL Session Chair: N.N.	
14.55 – 15.15	VARIATIONAL MULTISCALE LES INVESTIGATION OF DRAG AND NEAR-WAKE FLOW OF AN AXISYMMETRIC BLUNT-BASED BODY <u>A. Mariotti</u> , M.V. Salvetti, G. Buresti	LARGE-EDDY SIMULATION OF A FSI-INDUCED OSCILLATION TEST CASE IN TURBULENT FLOW <u>M. Münsch</u> , A. Delgado, M. Breuer	
15.15 – 15.35	SVV-LES OF FLOW AROUND THE SQUARE BACK AHMED BODY <u>N. Peres</u> , R. Pasquetti	ACTIVE FLOW CONTROL AND SHAPE OPTIMIZATION FOR TRUCK-TRAILERS USING LARGE-EDDY SIMULATION AND RESPONSE SURFACES <u>P. Kjellgren</u> , M. El-Alti, L. Davidson	
15.40 – 16.20	KEYNOTE LECTURE Session Chair: S. Sherwin		
15.40 – 16.20	ELEMENTS AND APPLICATIONS OF SCALE-RESOLVING SIMULATION METHODS IN INDUSTRIAL CFD F. Menter		
16.20 – 16.30	CLOSURE		