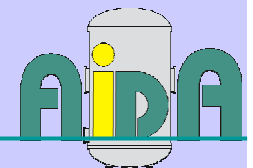


AIDA Laboratory Experiments

Ottmar Möhler

Stefan Benz, Thomas Leisner, Monika Niemand,
Harald Saathoff, Martin Schnaiter, Robert Wagner

Institute for Meteorology and Climate Research (IMK-AAF)
Forschungszentrum Karlsruhe



Overview VI-ACI Laboratory Experiments

Laboratory Experiments (O. Möhler)

WP-L1: AIDA

(O. Möhler)
IMK-AAF, ICG-I, ICG-II, UniF,
UniHD, UniMZ, UniHS, ETH

- AIDA cloud simulation experiments
→ 2 campaigns at mixed-phase cloud and cirrus temperature range
- Single levitated particle experiments

WP-L2: LACIS

(J. Heintzenberg)
IfT, ICG-II, UniMZ

- LACIS experiments at IfT Leipzig
→ CCN aerosol properties
→ Ice nucleation
- Application of mobile LACIS

WP-L3: ZINC

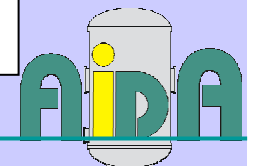
(O. Stetzer)
ETH

- ZINC measurements at ETH
→ IN properties of aerosol particles
- Application of mobile IN chamber PINC
- Single particle analysis with PALMS

WP L4: SAPHIR

(Th. F. Mentel)
UniMZ, ICG-II, IfT, ETH

- SAPHIR experiments at ICG-2, Jülich
→ Chemical transformation of CCN and IN
- Aerosol MS application for chemical analysis



Overview Work Package WP-L1

Partners

FISH, ICG-1

TDL, Uni Heidelberg

FINCH, Uni Frankfurt

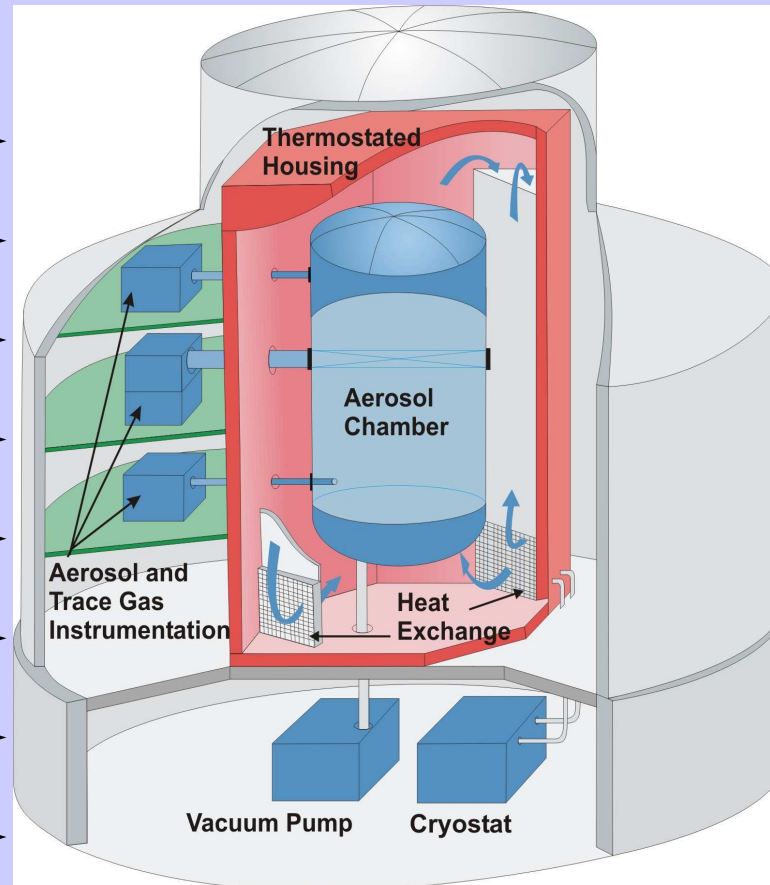
PINC, ETH

LACIS, IfT

AMS, Uni Mainz

AMS, ICG-2

SID, U Hertfordshire

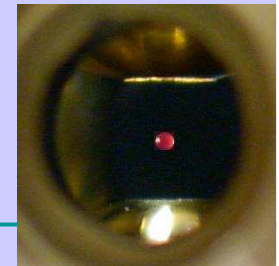
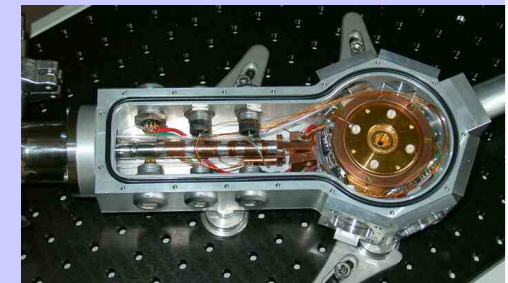


Campaign 1:
Mixed-phase cloud
temperatures.

Campaign 2:
Cirrus cloud
temperatures.

Experiments with single
levitated particles.

External partners:
University Manchester
LaMP Clermont-Ferrand
NCAR



Ice nucleation workshop September 2007

AIDA campaign November 2007 (IMK-AAF, LaMP, IfT, ICG-2, U-HD, U-Man)

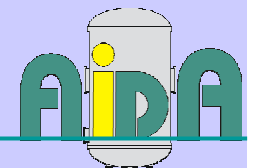
→ CCN and IN of GfG soot and CAST soot

AIDA campaign February 2008 (IMK-AAF, U-HD)

→ Crystallisation and IN of ammonium sulphate and oxalic acid

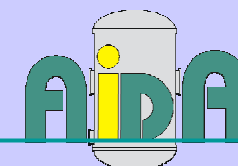
AIDA campaign planned for October 2008

→ will be discussed tomorrow



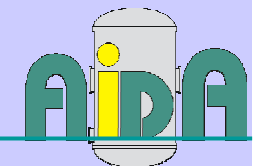
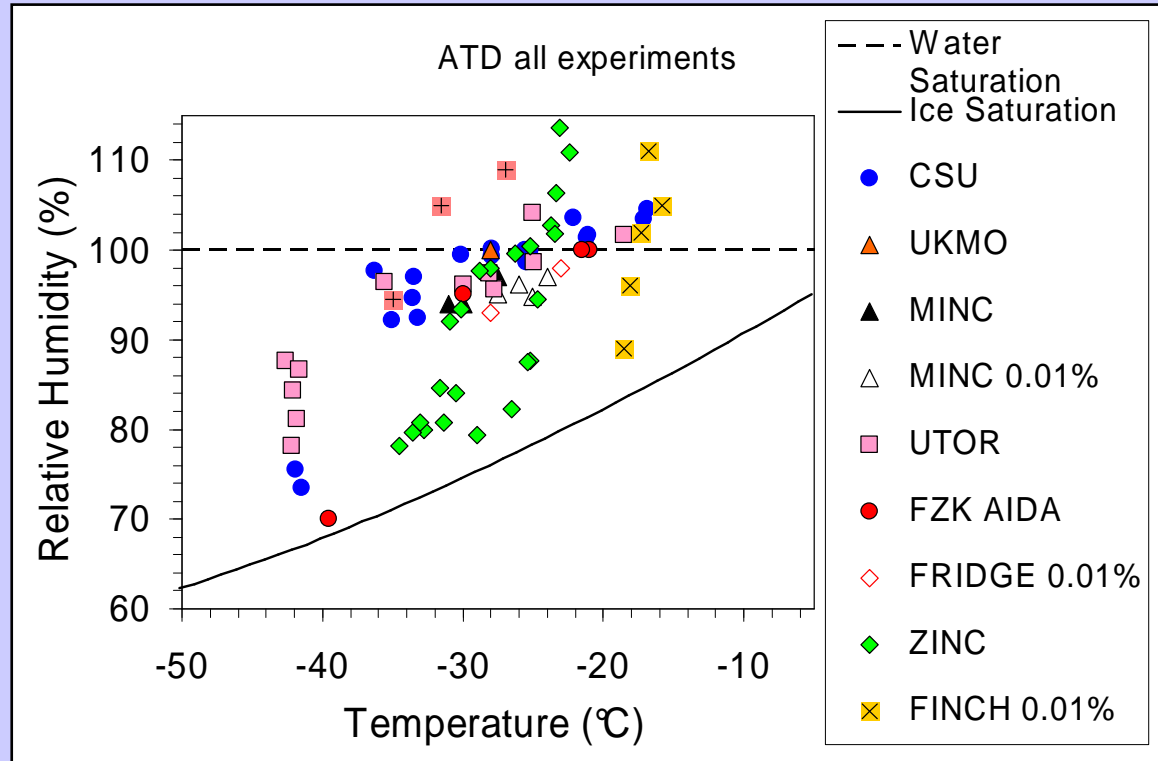
Ice Nucleation Workshop ICIS-2007

Name	Institute	Instrument
Ottmar Möhler , Stefan Benz, Harald Saathoff, Martin Schnaiter, Roland Schön, Robert Wagner	IMK-AAF, Forschungszentrum Karlsruhe, Germany	AIDA (host)
Continuous Flow Diffusion Chambers with cylindrical design (Rogers 1988):		
Paul DeMott , Markus Petters	Colorado State University, Fort Collins, CO, USA	CSU CFDC-1H
Masataka Murakami , Atsushi Saito, Takuya Tajiri	MRI, Tsukuba, Japan	MRI CFDC
Richard Cotton , James Bowels	UK Met Office	UKMO CFDC
Hazel Jones	University of Manchester, UK	MINC
New designs and instruments:		
Olaf Stetzer , Mathieu Nicolet, Berko Sierau, Ulrike Lohmann	ETH Zurich, Switzerland	ZINC
Zamin Kanji , Jon Abbatt	University of Toronto, Canada	UTOR CFDC
Ulrich Bundke , Björn Nillius	University of Frankfurt, Germany	FINCH
Heinz Bingemer , Werner Hahnold, Holger Klein, Thomas Wetter	University of Frankfurt, Germany	FRIDGE
Zev Levin, Eli Ganor, Karin Ardon	Tel Aviv University, Israel	TAU-FRIDGE
Thomas Leisner , Daniel Rzesanke	MK-AAF, Forschungszentrum Karlsruhe, Germany	IMK EDB
Supporting ice nuclei and cloud particle instruments		
Dan Cziczo , Stéphane Gallavardin	ETH Zurich, Switzerland	PALMS single particle MS
Admir Tagino , James Dorsey	University of Manchester	CPI, CDP
Dimitri Georgakopoulos	Agricultural University of Athens, Greece	Bacteria preparation



ICIS-2007 Program and Results

Date	NoE	Aerosol
Sep 11	1	Arizona Test Dust ATD
Sep 12	2	Arizona Test Dust ATD
Sep 13	3	Saharan Dust SD4
Sep 14	4	Sulphuric Acid, Ammonium Sulphate
Sep 17	5	Arizona Test Dust ATD
Sep 17	6	Arizona Test Dust ATD
Sep 18	7	Arizona Test Dust ATD
Sep 19	8	Arizona Test Dust ATD
Sep 20	9	GSG Spark Generator Soot
Sep 21	10	GSG Spark Generator Soot
Sep 22	11	Israeli Dust ID1
Sep 22	12	Israeli Dust ID1
Sep 24	13	Israeli Dust ID1
Sep 25	14	Saharan Dust SD4
Sep 26	15	Canary Island Dust CI1
Sep 27	16	Snomax™ Bacterial Cells
Sep 28	17	<i>P. Syringae</i> Bacteria



First VI-ACI Campaign November 19-30, 2007

Objective:

Investigate CCN and IN of CAST soot and flame soot, in particular after coating with sulphuric and organic acids.

Partners:

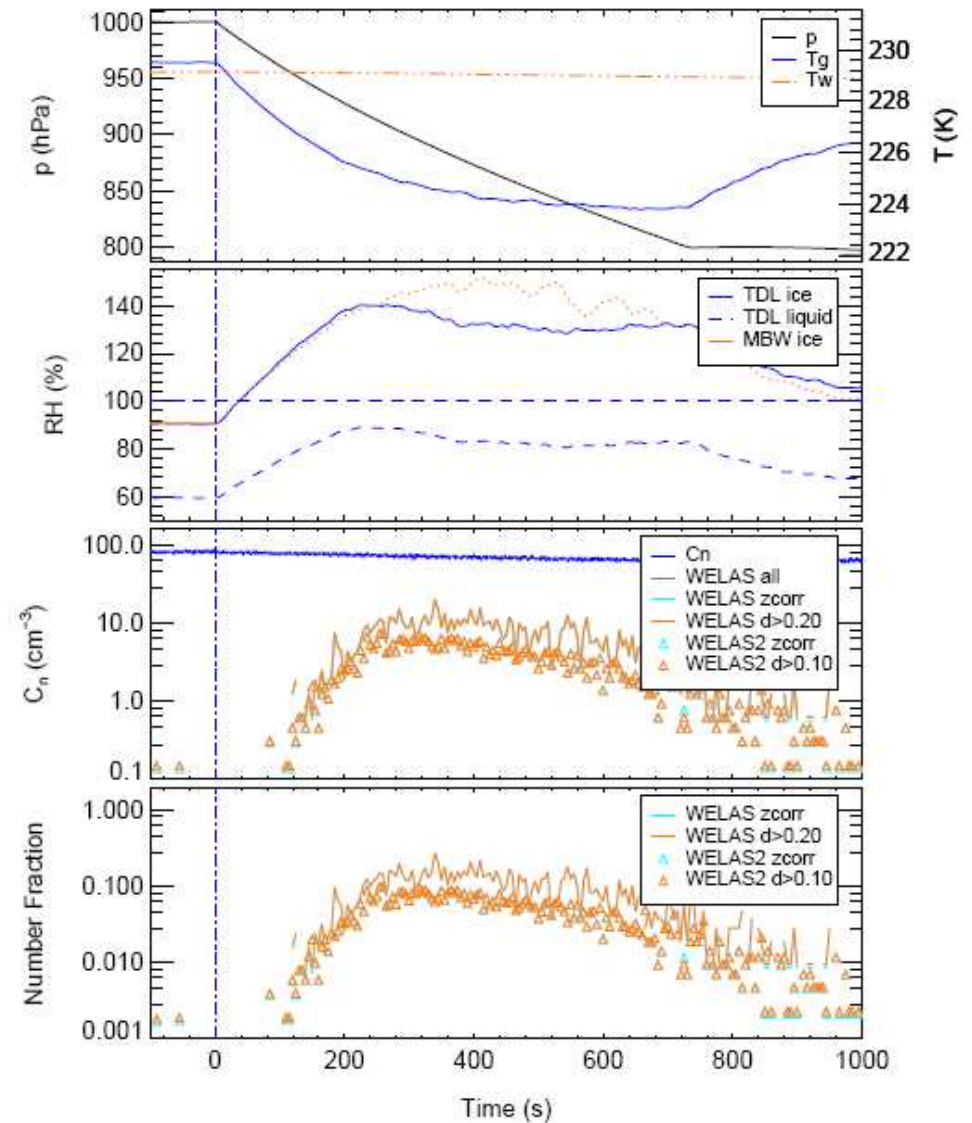
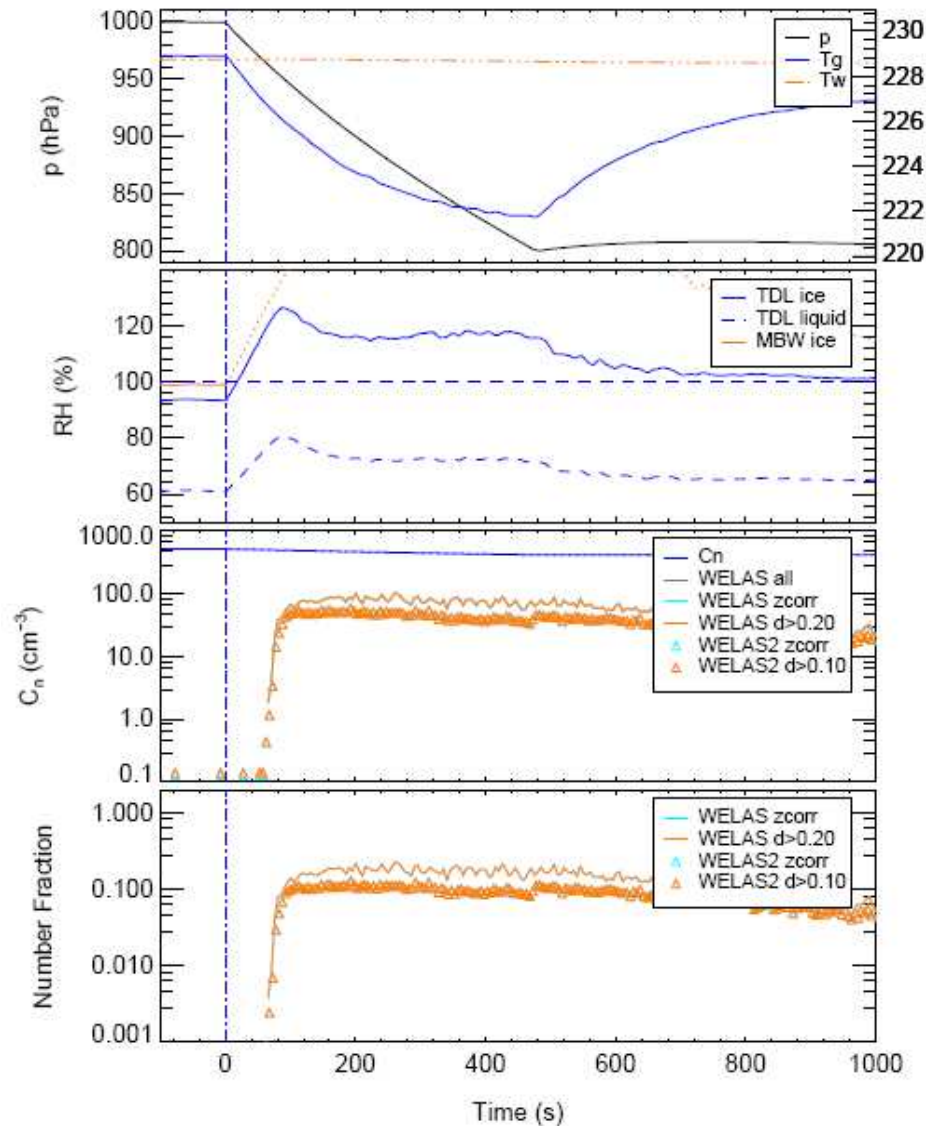
LaMP Clermont-Ferrand
ICG-2 Jülich
IfT Leipzig
University of Manchester

AIDA ice nucleation campaign IN11, November/December 2007							
Experiment parameters							
Kampagne	ExperimentNr	Typ	SequenzNr	Pumpstaerke	tref	p_0	tgas_0
IN11	12	IN_GfG-Ar	1	P2 60%	19.11.2007 11:45:00	999.2	228.9
IN11	13	IN_GfG-Ar	2	P2 50%	19.11.2007 15:05:00	1000.3	229.2
IN11	14	IN_GfG-Ar+SulphAcid	3	P3 40%	19.11.2007 17:02:00	1001.3	229.3
IN11	15	IN_GfG-N2	1	P2 40%	20.11.2007 15:05:00	1000.2	229.5
IN11	16	IN_GfG-N2	2	P2 50%	20.11.2007 17:10:00	1000.0	229.3
IN11	17	IN_ref	0	P2 50%	21.11.2007 12:32:00	999.1	228.9
IN11	18	IN_GfG-Ar_SuccAcidCoated	1	P2 50%	21.11.2007 15:42:00	999.0	228.9
IN11	19	IN_GfG-Ar_SuccAcidCoated	2	P2 40%	21.11.2007 17:30:00	999.1	229.0
IN11	20	IN_CAST-MinOC	1	P2 40%	22.11.2007 10:35:00	997.3	228.8
IN11	21	IN_CAST-MinOC	2	P2 40%	22.11.2007 13:30:00	995.1	228.7
IN11	22	IN_CAST-MinOC	3	P2 40%	22.11.2007 15:30:00	995.3	228.8
IN11	23	IN_Ref	0	P2 40%	23.11.2007 09:50:00	997.6	228.7
IN11	24	IN_CAST-MinOC_SulphAcidCoated	1	P2 40% (?)	23.11.2007 12:10:00	999.5	228.7
IN11	25	IN_CAST-MinOC_SulphAcidCoated	2	P2 40%	23.11.2007 15:10:00	1000.3	228.8
IN11	26	IN_CAST-MaxOC	1	P2 var	26.11.2007 12:15:00	1013.2	228.4
IN11	27	IN_CAST-MaxOC	2	P2 var	26.11.2007 14:15:00	1013.2	228.3
IN11	28	IN_CAST-MaxOC	3	P2 90%	26.11.2007 16:00:00	1013.2	228.2
IN11	29	IN_Ref	0	P2 90%	27.11.2007 09:15:00	1015.0	228.0
IN11	30	IN_CAST-MaxOC_SulphAcidCoated	1	P2 40%	27.11.2007 11:15:00	1015.2	228.1
IN11	31	IN_CAST-MaxOC_SulphAcidCoated	2	P2 60%	27.11.2007 13:45:00	1015.3	228.1
IN11	32	IN_CAST-MaxOC_SulphAcidCoated	3	P2 50%	27.11.2007 16:30:00	1015.1	228.0
IN11	33	IN_Ref	0	P2 80%	28.11.2007 10:15:00	1013.2	227.9
IN11	34	IN_CAST-MedOC_SulphAcidCoated	1	P2 40%	28.11.2007 13:30:00	1011.1	228.0
IN11	35	IN_CAST-MedOC_SulphAcidCoated	2	P2 50%	28.11.2007 15:35:00	1008.1	228.0
IN11	36	IN_Ref	0	P2 80%	29.11.2007 09:30:00	0.0	0.0
IN11	37	IN_CAST-MediumOC	1	P2 60%	29.11.2007 11:00:00	1003.1	228.2
IN11	38	IN_CAST-MediumOC	2	P2 80-90%	29.11.2007 13:15:00	1002.9	228.1
IN11	39	IN_CAST-MediumOC	3	P2 95%	29.11.2007 15:45:00	1003.1	228.1
IN11	40	IN_OxalicAcid	1	P2 40%	30.11.2007 13:00:00	1001.0	227.9
IN11	41	IN_OxalicAcid	2	P2 30%	30.11.2007 15:10:00	1001.0	228.0

Results IN11 November 2007

GfG soot, Argon

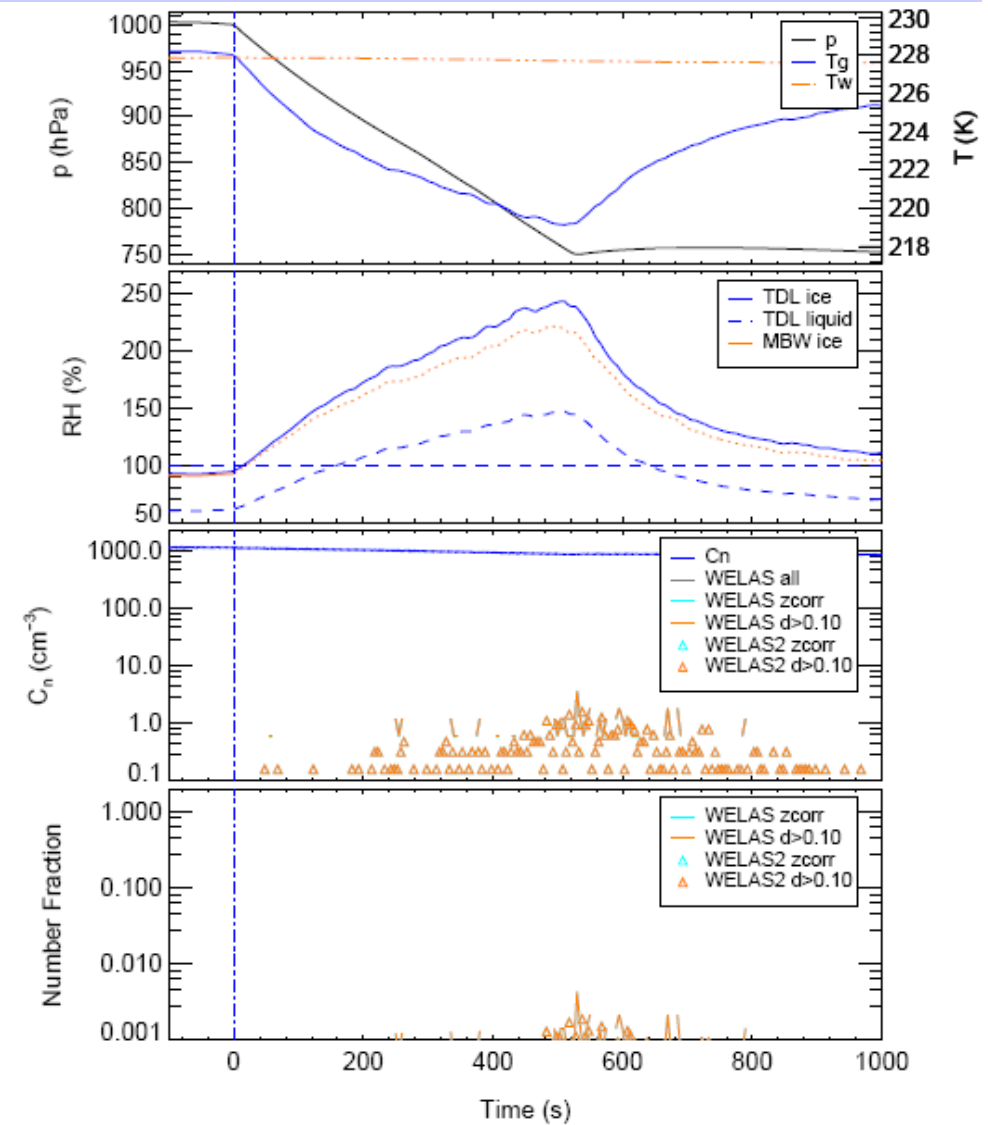
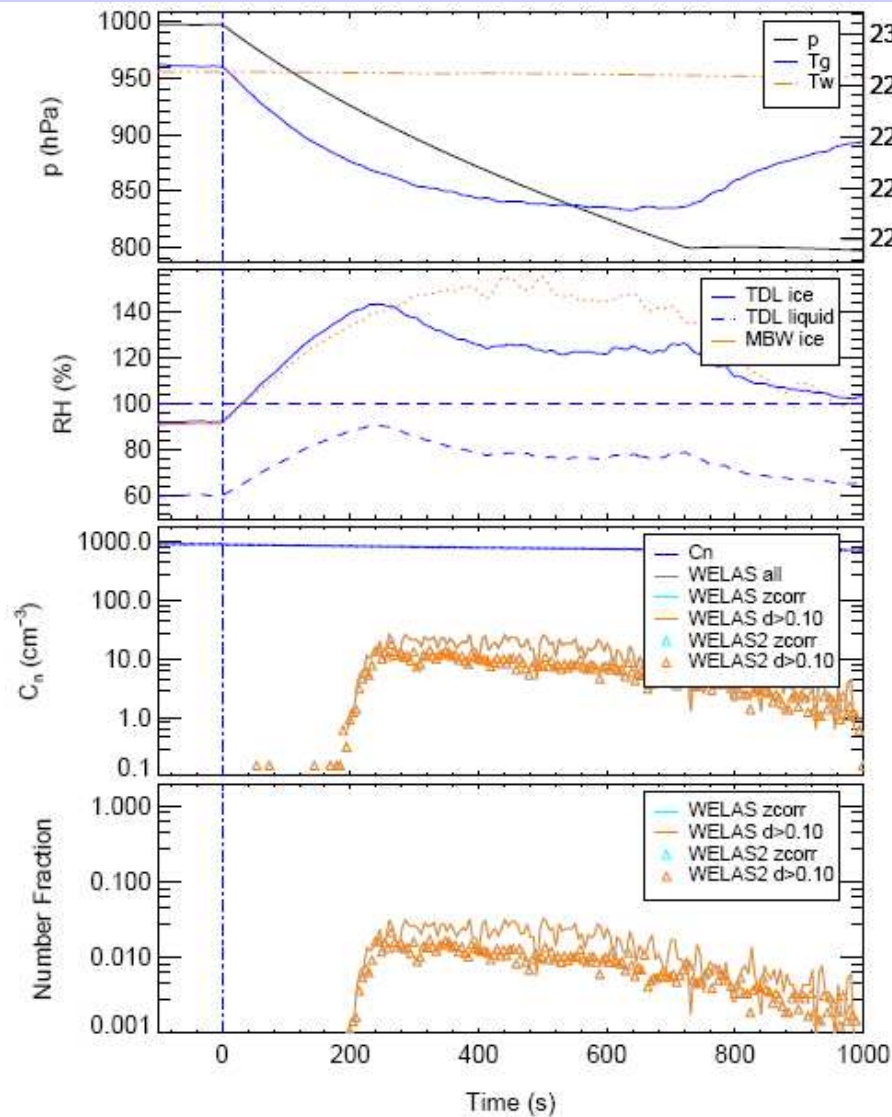
GfG soot, Nitrogen



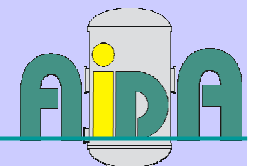
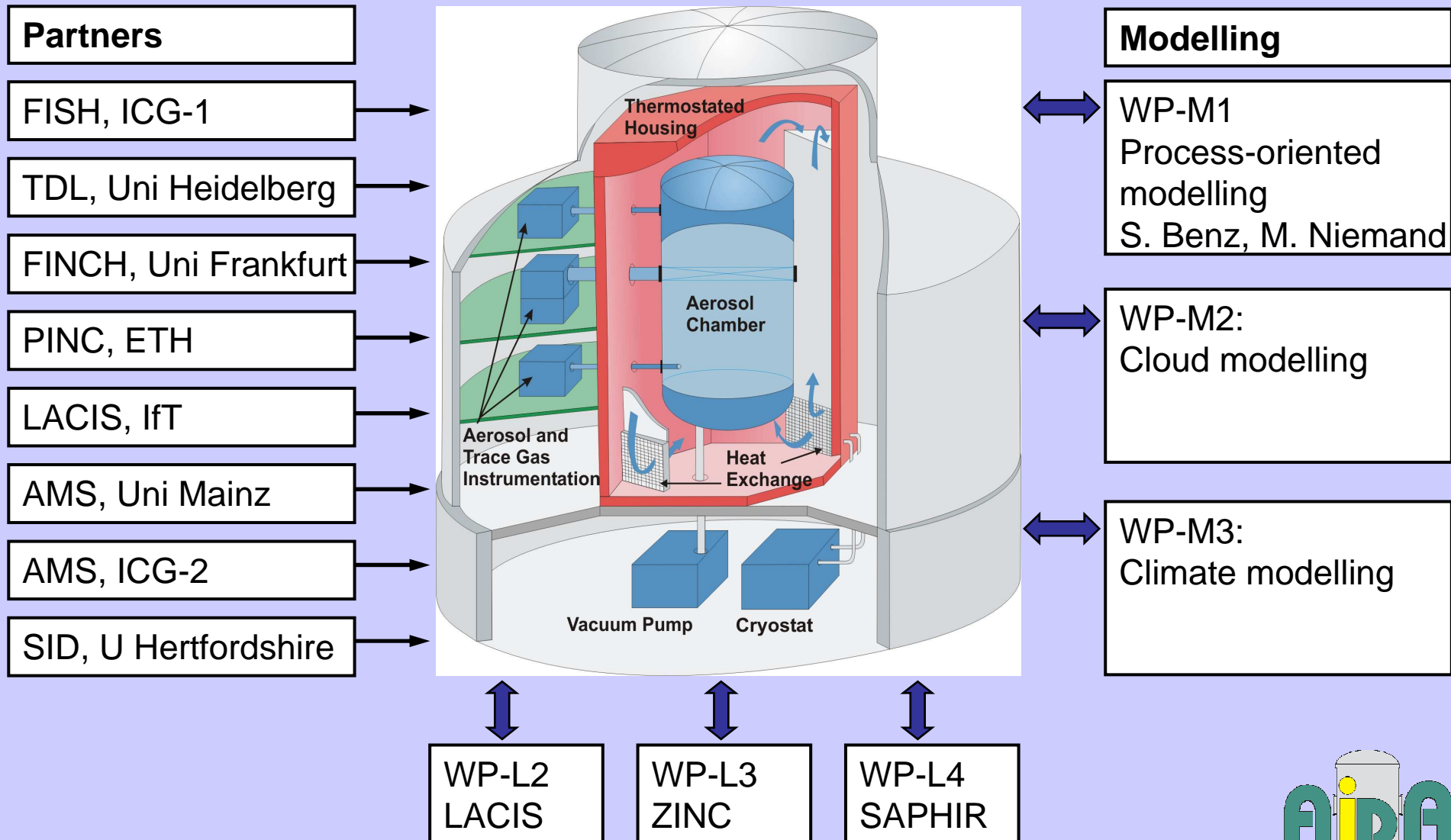
Results IN11 November 2007

CAST soot, min OC

CAST soot, max OC



Co-operations and Interactions



MS L1A:

AIDA campaign 1 finished and data available for model studies
(AIDA team, month 12)

MS L1B:

AIDA campaign 2 finished and data available for model studies
(AIDA team, month 18)

MS L1C:

Report on ice nucleation workshop available (month 24)

