ADAS-EU and ADAS fusion support

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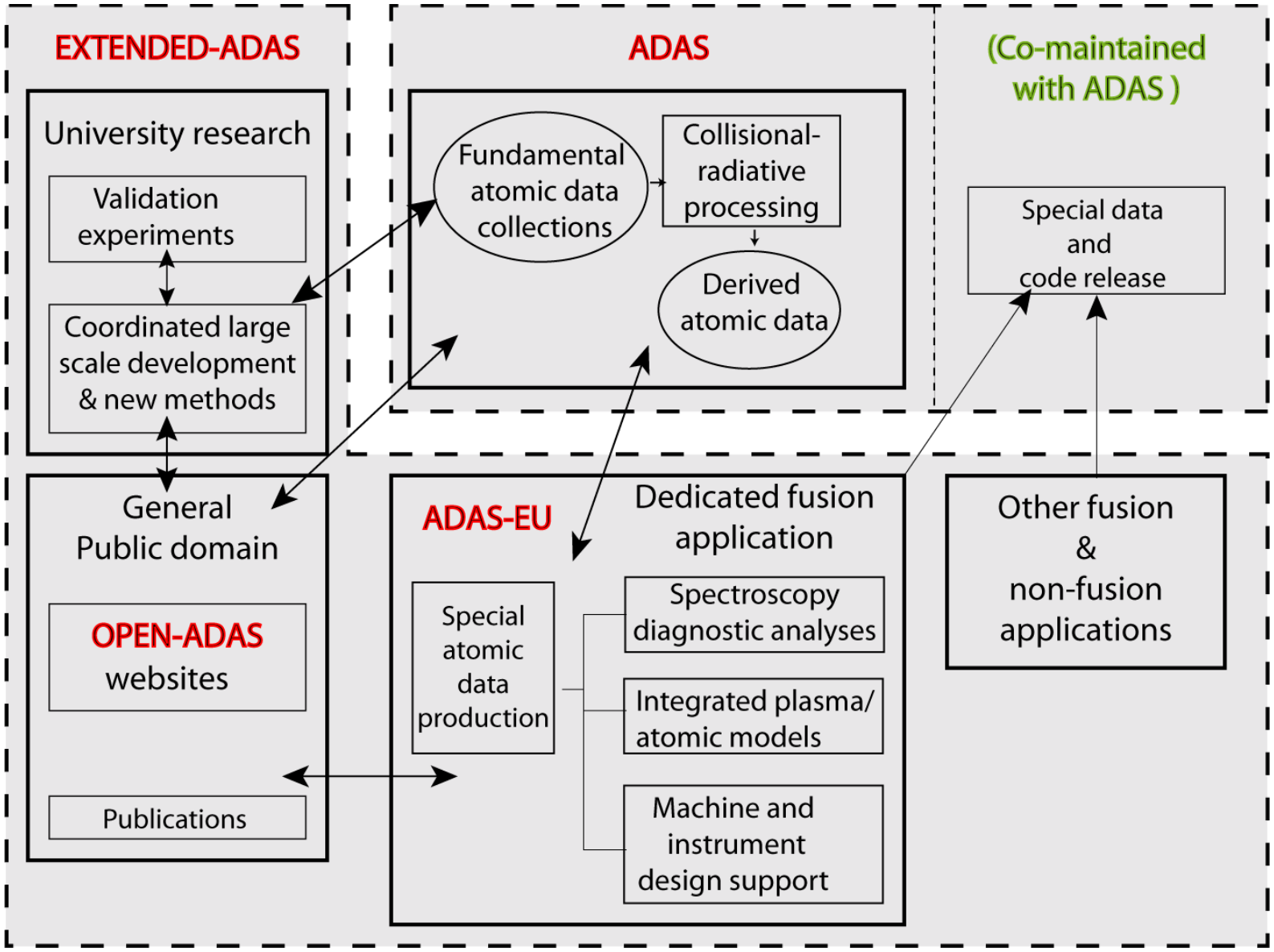
CEA Cadarache

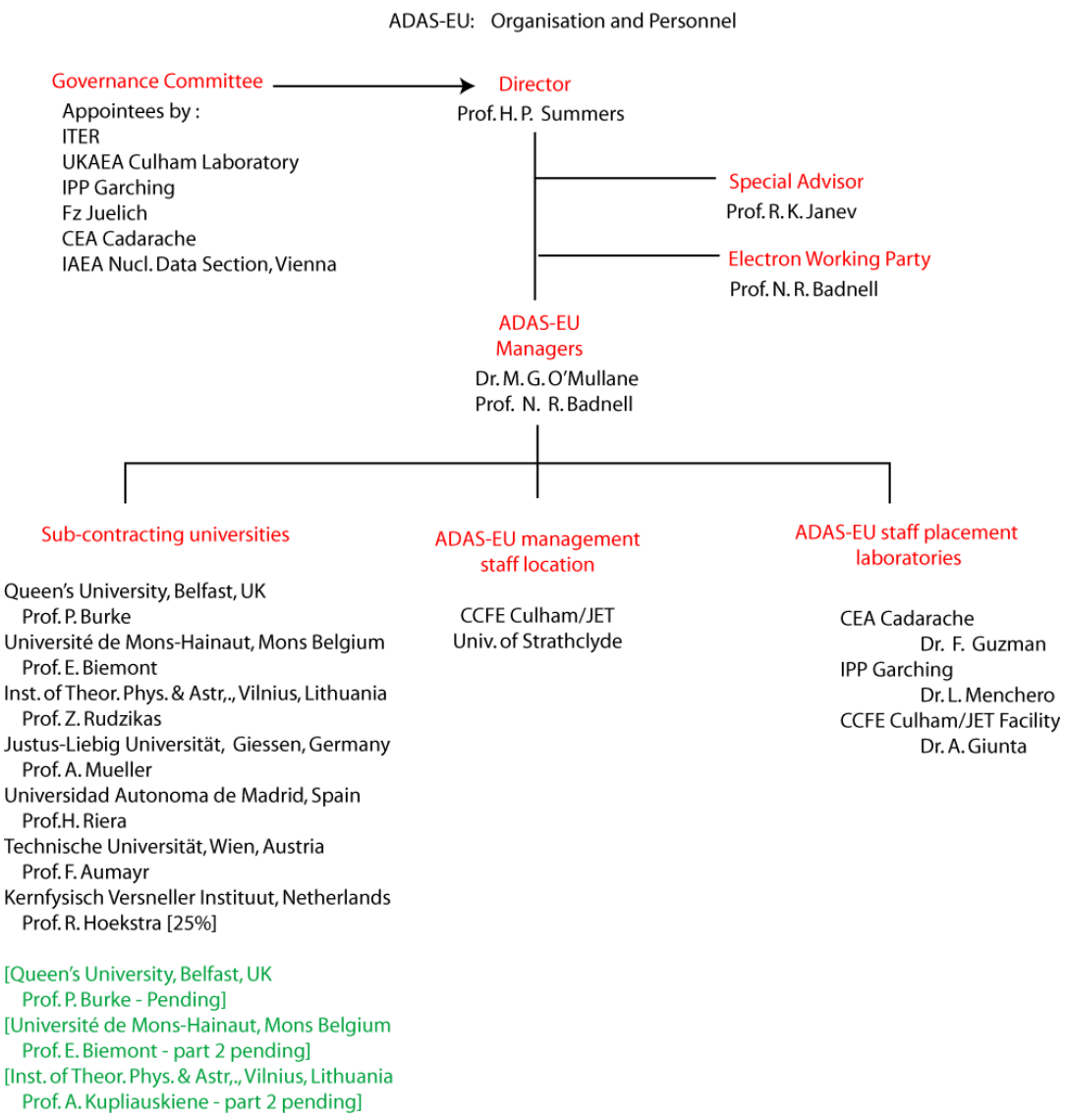
The ADAS family and their relationships



ADAS -EU

- Management and personnel
- Scientific themes and their implementation
- External support action
- Some scientific achievements

ADAS-EU: organisation



ADAS-EU: physics theme development time chart

ADAS-EU: Physics theme and sub-theme support time chart

Theme	Code	Actions	2009	2010	2011	2012
Heavy element [1] spectroscopy and models	T1	applic.		Superstages & emissivities		Global scaling
		fund.	Baseline & emissivities [2]	Ionisation level 1	DR/GBPP level 1	Neutrals, level 2
		exploit. [3]	Heavy species in ITER studies	Tungsten spectral emission (ASDEX-U, JET)	Atomic model support of ITM for ITER	
Charge exchange spectroscopy	T2	applic.	CXSFIT shared analysis	Parametric CXS	NEW-CHEAP shared analysis	CXS/UTC/transport link
		fund.	Bundle-n & l-mix models	CTMC (improved) /CCAO/CCMC	Bundle-nl models for partially stripped receivers	
		exploit	CXS line fittiing extended to argon	Multi-line CXS region observation	Cross-linked CXS & passive diagnostic	
Beam stopping beam emission spectroscopy	T3	applic.		Li/Na beam analysis and database		Beam emission/beam stopping consistency
		fund.	Li/Na beam database	Bundle-n & Stark GCR →		
		exploit.		Li/Na beam edge parameter diagnosis	Beam emission exploitation for ITER	
Special features	T4	applic.		←	Integrated special feature fitting and display	
		fund.		Zeeman, soft-X-ray, Balmer series special features		
		exploit.		Fitting with spectral primitives	He-like soft X-ray line analysis	Balmer series/limit observations
Diatomic spectra and coll-rad models	T5	applic.			H_2 isotopomer spectral simul. →	
		fund.	H_2/H electr. & ion database	H_2/H vibronic/GCR populations →		
		exploit.				Integrated edge modelling
Medium-weight element GCR and DR	T6	applic.				GCR population modelling to argon ? --> nickel
		fund.				Metastable ionis. fract. Autostructure DW xsect.
		exploit.				Transient diagnostics, fusion/astro cross-validation

ADAS-EU : sub-contract work package time chart

ADAS-EU: Sub-contract work package time chart

Theme	Sub-contract work package	2009	2010	2011	2012
Heavy element spectroscopy and models	S1				RMATRIX-II & DARC xsects.
	S2	Neutral & near-neutral structure →			
	S3	Heavy atom ionis/excit xsects. →			
	S4	Ionis. & dielectronic xsect. meas. →			
Charge exchange spectroscopy	S5	Improved CTMC & CCMO xsects. →			
	S8 (25%)	Ion impact xsect. update			
Beam stopping beam emission spectroscopy	S6	CCAO xsects and Li/NA beam database update →			
Special features	S7	Multiple perturber PPP broadening data (deleted)			
Heavy element spectroscopy and models	S8				Neutral & near-neutral structure (part 2)
	S7				Heavy atom ionis/excit xsects. (part 2)
OPEN-ADAS update	S9				Extension of facilities and adf number coverage

ADAS-EU support visits Jul. 2010 – Dec. 2011

ADAS-EU staff visits

Place	*Person*	*Date*	*Role*
UAM Madrid	Guzman	10 Nov - 10 Nov 2010	ADAS-EU subcontract support
U Strathclyde	Summers	08 Jan - 09 Jan 2011	ADAS-EU coordination
U Giessen	Badnell	21 Mar - 23 Mar 2011	ADAS-EU subcontract support
U Giessen	Summers	21 Mar - 23 Mar 2011	ADAS-EU subcontract support
EFDA-JET	Badnell	25 May - 26 May 2011	ADAS-EU ECWP meeting
UCL London	Summers	10 Jun - 10 Jun 2011	ADAS-EU Quantemol/ADAS-EU link
U Vilnius	Badnell	22 Sep - 20 Sep 2011	ADAS-EU subcontract support
U Nicosia	Guzman	03 Oct - 13 Oct 2011	ADAS-EU ITM/ADAS-EU data link

Dr. O'Mullane visits

Place	Date	Role	Funding Note
NFRI (Korea)	25 Jun 2010 -Jul 2010	ADAS	ADAS + NFRI ADAS support visit
Auburn U	05 Jul 2010 - 14 Jul 2010	ADAS	ADAS-US course
ITER	25 Jul 2010 - 30 Jul 2010	ADAS-EU	ITER subsist/ADAS-EU travel VUV UP CDR
Armagh Obs.	03 Oct 2010 - 05 Oct 2010	ADAS	ADAS Workshop
ITER	15 Nov 2010 - 19 Nov 2010	ADAS-EU	ITER subsist/ADAS-EU travel X-ray UP CDR
ITER	29 Nov 2010 - 03 Dec 2010	ADAS-EU	ITER ADAS-EU ITER course
U Strathclyde	07-02-2011 - 09-02-2011	ADAS-EU	ADAS-EU coordination
ITER	13-02-2011 - 28-02-2011	ADAS-EU	ITER
CEA Cadarache	13-03-2011 -19-03-2011	ITM	CCFE/Mobility ADAS atomic data linkage
ITER	20-03-2011 - 25-03-2011	ADAS-EU	ITER
ITER	13-04-2011 - 22-04-2011	ADAS-EU	ITER VUV survey and divertor CDR
U Helsinki	16-05-2011 - 20-05-2011	ITM	CCFE/Mobility ADAS atomic data linkage
ITER	18-07-2011 - 22-07-2011	ADAS-EU	ITER
TUW	06-09-2011 - 06-09-2011	ADAS-EU	IAEA sub-contract support
IAEA	07-09-2011 - 09-09-2011	ADAS	IAEA DCN meeting and meet VAMDC representative
ITER	19-09-2011 - 23-09-2011	ADAS-EU	ITER H-alpha CDR
Auburn U	05-10-2011 - 15-10-2011	ADAS	ADAS Workshop and ADAS-US course
PPPL	16-10-2011 - 18-10-2011	ADAS	ADAS part of above trip
U Mons	26-10-2011 - 28-10-2011	ADAS-EU	ADAS-EU sub-contract support
ITER	04-12-2011 - 09-12-2011	ADAS-EU	ITER
India	12-12-2011 - 17-12-2011	ADAS	ADAS CDAMOP conference

ADAS-EU: physics theme discussion

ADAS-EU: Physics theme and sub-theme support time chart

Theme	Code	Actions	2009	2010	2011	2012
Heavy element [1] spectroscopy and models	T1	applic.		Superstages & emissivities		Global scaling
		fund.	Baseline & emissivities [2]	Ionisation level 1		DR/GBPP level 1 Neutrals, level 2
		exploit. [3]	Heavy species in ITER studies	Tungsten spectral emission (ASDEX-U, JET)		Atomic model support of ITM for ITER
Charge exchange spectroscopy	T2	applic.	CXSFIT shared analysis Parametric CXS		CXS/UTC/transport link	
		fund.	Bundle-n & l-mix models	CTMC (improved) /CCAO/CCMC	Bundle-nl models for partially stripped receivers	
		exploit	CXS line fittiing extended to argon	Multi-line CXS region observation		Cross-linked CXS & passive diagnostic
Beam stopping beam emission spectroscopy	T3	applic.				Beam emission/beam stopping consistency
		fund.	Li/Na beam database		Bundle-n, Stark projection and Stark GCR	
		exploit.				Beam emission exploitation for ITER
Special features	T4	applic.		Integrated special feature fitting and display		
		fund.		Zeeman, soft-X-ray, Balmer series special features		
		exploit.		Fitting with spectral primitives	He-like soft X-ray line analysis	Balmer series/limit observations
Diatomic spectra and coll-rad models	T5	applic.				H_2 isotopomer spectral simul.
		fund.			H_2/H electr. & ion database	H_2/H vibronic/GCR populations
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Medium-weight element GCR and DR	T6	applic.				GCR population modelling to argon ? --> nickel
		fund.				Metastable ionis. fract. Autostructure DW xsect.
		exploit.				Transient diagnostics, fusion/astro cross-validation

ADAS-EU : sub-contract results discussion

ADAS-EU: Sub-contract work package time chart

Theme	Sub-contract work package	2009	2010	2011	2012
Heavy element spectroscopy and models	S1				RMATRIX-II & DARC xsects.
	S2			Neutral & near-neutral structure	
	S3			Heavy atom ionis/excit xsects. and atomic structure	
	S4			Ionis. & dielectronic xsect. meas.	
Charge exchange spectroscopy	S5			Improved CTMC & CCMO xsects.	
	S8 (25%)				
Beam stopping beam emission spectroscopy	S6			CCAO xsects and Li/NA beam database update	
Special features	S7				

Heavy element spectroscopy and models	S8				Neutral & near-neutral structure (part 2)
	S7				Heavy atom ionis/excit xsects. (part 2)

Electron working party

ADAS-EU Reports

ADAS-EU completion reports PUBL series

Summative documents comprising atomic theory and model developments stemming from the themes.
Each is also a comprehensive user guide to the codes, code packages and data added to ADAS

Report	Title	Principal authors
PUBL_1:	Charge exchange spectroscopy for fusion plasmas	Francisco Guzman, Hugh Summers
PUBL_2:	Special features and spectral analysis for fusion plasmas	Martin O'Mullane, Hugh Summers
PUBL_3:	Heavy species in fusion plasma modelling and spectral analysis	Hugh Summers, Martin O'Mullane, NIgel Badnell
PUBL_4:	Neutral Beam Emission: The Motional Stark Effect	Luis Menchero, Hugh Summers
PUBL_5:	GCR modelling for medium weight elements	Alessandra Giunta, Hugh Summers, Martin O'Mullane
PUBL_6:	The ADAS molecular population model for fusion plasmas	Francisco Guzman, Hugh Summers