



## Minutes of the Second Bi-annual HELCATS Project Meeting and the First Annual Open Workshop

18-22 May 2015

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The Second Bi-Annual HELCATS Project Meeting was held at Göttingen, Germany on 18-19 May 2015, hosted by Professor Volker Bothmer of the University of Göttingen. The meeting was attended by representatives from all of the beneficiaries (IMPERIAL, ROB, STFC, TCD, UGOE, UH, UNIGRAZ and UPS) as well as the EC Project Officer and the Reviewer (see below). The meeting was chaired by the Project Coordinator. The full attendee list is given below:

### Attendees:

STFC	Richard Harrison, Jackie Davies, Chris Perry, David Barnes, Mario Bisi, Jason Byrne, Matthew Wild
UGOE	Volker Bothmer, Adam Pluta, Julius Achenbach, Eckard Bosman, Johannes Hinrichs, Niclas Mrotzek, Malte Venzmer, Laura Volpes
ROB	Luciana Rodriguez, Jasmina Magdalenic, Sarah Willems
UPS	Alexis Rouillard, Rui Pinto, Illya Plotnikov, Eduardo Sanchez-Diaz
TCD	Peter Gallagher, Eoin Carley, Pietro Zucca
IMPERIAL	Jonathan Eastwood, Bob Forsyth, Simon Good
UNIGRAZ	Christian Möstl, Manuela Temmer, Peter Boakes
UH	Emilia Kilpua, Alexey Isavnin
EC	Sabri Mekoui (Project Officer)
Paris Observatory	Brigitte Schmieder (Reviewer)

All work-packages (WP) were reviewed in turn, through presentations from the WP leads or their representatives. The Powerpoint presentations have been placed on the HELCATS website ([www.helcats-fp.eu](http://www.helcats-fp.eu) – lodged in project Wiki).

Shortly prior to the meeting, the HELCATS Annual Report was compiled and submitted to the EC Project Officer, for inspection by the Project Officer and the Reviewer. This report is also available on the HELCATS website and it also summarises progress in all WPs. We do not reproduce the WP summaries here but refer the reader to the Annual Report and the presentations on the website.

The meeting was attended by the Reviewer, appointed by the EC, namely Professor Brigitte Schmieder (Observatoire de Paris, Meudon, France). Provision was made in the agenda to allow her to raise questions in response to all presentations and to provide a brief summary of her impressions at the end of the meeting. Subsequent to the meeting, a formal report from the EC gave a very positive response to the Annual Report and to progress of the HELCATS project. No amendments to the Annual Report were requested.

Actions from the meeting have been combined with those from the Annual Open Workshop, below.

## Annual Open Workshop

The HELCATS Annual Open Workshop was held at Göttingen, Germany on 19-22 May 2015, hosted by Professor Volker Bothmer of the University of Göttingen. The organising committee consisted of Professor Bothmer with Dr Jackie Davies and Professor Richard Harrison (both of STFC).

The Workshop was attended by 44 people from 8 countries and the EC (Austria 2, Belgium 5, Finland 2, France 5, Germany 10, Ireland 4, UK 12, USA 3, EC 1). The full attendee list is below:

Julius Achenbach (UGOE), David Barnes (STFC, UK), Doug Biesecker (NOAA/SWPC, USA), Mario Bisi (STFC, UK), Peter Boakes (UNIGRAZ, Austria), Eckard Bosman (UGOE, Germany), Volker Bothmer (UGOE, Germany), Jason Byrne (STFC, UK), Eoin Carley (TCD, Ireland), Jackie Davies (STFC, UK), Judith de Patoul (Exeter University, UK), Jonathan Eastwood (IMPERIAL, UK), Li Feng (Max Planck, Göttingen, Germany), Bob Forsyth (IMPERIAL, UK), Peter Gallagher (TCD, Ireland), Mark Gibbs (Met Office, UK), Simon Good (IMPERIAL, UK), Richard Harrison (STFC, UK), Johannes Hinrichs (UGOE, Germany), Tim Howard (SWRI, USA), Bernd Inhester (Max Planck, Göttingen, Germany), Alexey Isavnin (UH, Finland), Miho Janvier (University of Dundee, UK), Emilia Kilpua (UH, Finland), Jasmina Magdalenic (ROB, Belgium), Sabri Mekaoui (EC), Christian Möstl (UNIGRAZ, Austria), Niclas Mrotzek (UGOE, Germany), Dusan Odrstcil (George Mason University, USA), Rui Pinto (UPS, France), Illya Plotnikov (UPS, France), Adam Pluta (UGOE, Germany), Stefaan Poedts (Leuven University, Belgium), Luciana Rodriguez (ROB, Belgium), Alexis Rouillard (UPS, France), Eduardo Sanchez-Diaz (UPS, France), Brigitte Schmieder (Paris Observatory, France), Peter Thorn (Met Office, UK), Malte Venzmer (UGOE, Germany), Laura Volpes (UGOE, Germany), Sarah Willems (ROB, Belgium), Andrei Zhukov (ROB, Belgium), Pietro Zucco (TCD, Ireland).

The Workshop was loosely scheduled into five sessions defined in the following way, with invited reviews given by selected key scientists as listed in the programme below:

- Session 1: Heliospheric imaging observations of solar wind structure;
- Session 2: Debating standards for making CME associations;
- Session 3: Remote-sensing/in-situ observations of heliospheric phenomena and their sources and impacts;
- Session 4: Development and application of heliospheric observations and techniques for scientific and space weather usage;
- Session 5: Future heliospheric space weather instruments/missions.

The meeting programme, including the invited and contributed talks, is given below. These presentations gave the foundation for much discussion on a range of issues relating to topics as wide ranging as space weather applications of HI data, the exploitation of radio observations, the use of spatial and temporal windows for associated event analyses, the development of modelling techniques etc... The presentations have been collected together and lodged on the HELCATS website for reference, and the reader is referred to those presentations; thus, we do not repeat their content here.

Actions from the Bi-Annual Meeting and the Annual Open Workshop are combined into one action list given at the end of this document.

**Tuesday 19<sup>th</sup> May****Session 1: Heliospheric Imaging observations of solar wind structure (e.g. CMEs, CIRs, turbulence): introductory and review talks**

14:00	Welcome address	V. Bothmer
14:10	HELCASTS – Heliospheric Cataloguing, Analysis and Techniques Service ( <i>Invited</i> )	R. Harrison, J. Davies & the HELCASTS Steering Committee
14:40	Dynamic evolution of coronal mass ejections ( <i>Invited</i> )	M. Temmer
15:20	ENLIL modelling support to the HELCASTS project	D. Odstrčil
15:40	<b>Coffee/tea</b>	
16:00	Heliospheric Imaging: the status quo and the future ( <i>Invited</i> )	T. Howard & C. DeForest
16:40	Thomson scattering revisited ( <i>Invited</i> )	B. Inhester
17:20	Comprehensive analysis of CME propagation speeds in STEREO COR2 and HI1 instruments	A. Pluta, V. Bothmer, E. Bosman, J. Davies, L. Volpes, M. Venzmer, N. Mrotzek, R. Harrison,
17:40	Comparing HELCASTS CIR catalogues derived from white-light images and in-situ measurements	I. Plotnikov & A. Rouillard
18:00	<b>End of session (followed by reception until 20:00)</b>	

**Wednesday 20<sup>th</sup> May****Session 2: Debating standards for making CME associations**

09:00	Linking CMEs to associated solar phenomena ( <i>Invited</i> )	P. Gallagher, P. Zucca & E. Carley
09:40	A review of the use of event associations in CME onset studies from SMM, SOHO and STEREO, leading to suggested standards for the future	R. Harrison
10:00	Discussion (including coffee from 10:20 to 10:40)	Chair: P. Gallagher
12:00	<b>Lunch (followed by excursion at 14:00)</b>	

**Thursday 21<sup>st</sup> May****Session 3: Remote-sensing/in-situ observations of heliospheric phenomena and their sources and impacts**

09:00	The most generic shape of interplanetary CMEs: A comparison of models and interplanetary event catalogues ( <i>Invited</i> )	M. Janvier, P. Demoulin & S. Dasso
09:40	Three-dimensional evolution of fast and slow CMEs from the Sun to 1 AU	A. Isavnin, S. Käki & E. Kilpua
10:00	Visualizations of the HI CME catalogue and solar wind magnetic field data	C. Möstl, P. Boakes, A. Isavnin, E. Kilpua & J. Davies
10:20	<b>Coffee/tea</b>	
10:40	The properties of the very slow solar wind measured inside 0.7 AU	E. Sanchez-Diaz, K. Segura, A. Rouillard, R. Pinto & B. Lavraud
11:00	Tracking the CME-driven shock wave on 2012 March 5 and radio triangulation of associated radio emission	J. Magdalenic, C. Marque, V. Krupar, M. Mierla, A. Zhukov, L. Rodriguez, M. Maksimovic & B.
11:20	Internal structure of interplanetary coronal mass ejections and relation to remote sensing observations	E. Kilpua, A. Isavnin, A. Vourlidas, H. Koskinen
11:40	Comparing interplanetary and in-situ properties of CME driven shocks	L. Volpes & V. Bothmer

<b>12:00</b>	<b>Lunch</b>	
<b>14:00</b>	First results of CME arrival time prediction at different planetary locations and their comparison to the in-situ data within the HELCATS project	P. Boakes, C. Moestl, J. Davies, R. Harrison, J. Byrne, D. Barnes, A. Isavnin, E. Kilpua & T. Rollett
<b>Session 3: Posters</b>		
	Assessing the complementary nature of radio measurements	J. Eastwood, M. Bisi, J. Magdalenic & R. Forsyth
	MESSENGER and Venus Express observations of magnetic clouds	S. Good & R. Forsyth
	Estimation of the 3D electron density distributions in the solar corona for more realistic solar wind	J. de Patoul, C. Foullon, D. Vibert, P. Lamy, C. Peillon & R. Frazin
<b>Thursday 21<sup>st</sup> May</b>		
<b>Session 4: Development and application of heliospheric observations and techniques for scientific and space weather usage</b>		
<b>14:20</b>	Initiation and evolution of CMEs in the inner heliosphere <i>(Invited)</i>	S. Poedts & J. Pomoell
<b>15:00</b>	Simulating the solar wind to the inner boundary of ENLIL	R. Pinto & A. Rouillard
<b>15:20</b>	Three dimensional morphology and dynamics of CMEs and CME-driven shocks	L. Feng & B. Inhester
<b>15:40</b>	<b>Coffee/tea</b>	
<b>16:00</b>	The propagation and space weather tools	A. Rouillard, R. Pinto, B. Lavraud & V. Genot
<b>16:20</b>	The new CORIMP CME catalogue & 3D reconstructions	J. Byrne, H. Morgan, S. Habbal & P. Gallagher
<b>16:40</b>	Tomographic reconstruction of CME densities in the ecliptic using STEREO HI1	D. Barnes
<b>17:00</b>	Towards an operational F-corona model for future heliospheric imaging instruments - cancelled	J. Rodmann, V. Bothmer, R. Howard, A. Thernisien, M. Venzmer & A. Vourlidas
<b>17:20</b>	Determination of the photometric calibration and large-scale flatfield of the STEREO HI2 cameras	J. Tappin, C. Eyles & J. Davies
<b>17:40</b>	Ongoing radio space-weather science studies using the LOW Frequency ARray (LOFAR)	M. Bisi, R. Fallows, C. Sobey, T. Eftekhari, E. Jensen, B. Jackson, H. Yu & D. Odstrcil
<b>18:00</b>	<b>End of session (followed by conference dinner at 19:30)</b>	
<b>Friday 22<sup>nd</sup> May</b>		
<b>Session 5: Future heliospheric and space weather instruments/missions</b>		
<b>09:00</b>	Operational Forecasting – what’s required in the heliosphere <i>(Invited)</i>	M. Gibbs
<b>09:40</b>	Carrington-L5: The next generation space weather monitoring mission	M. Trichas - held by R. Harrison
<b>10:00</b>	INSTANT (INvestigation of Solar-Terrestrial Activity aNd Transients)	B. Lavraud, Y. Liu & the INSTANT team - held by A. Rouillard
<b>10:20</b>	<b>Coffee/tea</b>	
<b>10:40</b>	The PROBA-3 mission and its contribution to space weather studies <i>(Invited)</i>	A. Zhukov & the PROBA-3/ASPIICS team
<b>11:20</b>	The Wide-field Imager for Solar PRobe+ (WISPR)	V. Bothmer, R.A. Howard & A. Vourlidas
<b>11:40</b>	Coronal and heliospheric imaging instrumentation development at RAL Space	J. Davies, C. Eyles, D. Griffin, R. Harrison, K. Middleton, A. Richards, J. Rogers, J. Tappin, I. Tosh & N. Waltham
<b>12:00</b>	<b>Wrap up (end of meeting)</b>	

Invited talks: 30 mins plus 10 mins discussion; contributed talks: 15 mins plus 5 mins discussion.

## ACTIONS – 22 May 2015

No.	Action	Actionee	Completion date
54	Executive Committee to ensure that all Steering Committee members have access to the Annual Report	Executive Committee	15 June
55	Steering Committee members to check the Annual Report for accuracy and get back to Richard or Jackie if any changes are required.	All SC members	30 June
56	Annual Report to be placed in HELCATS website	Chris Perry	15 June
57	All to provide details of any HELCATS-related publications to Chris Perry	All	Open ended
58	Brief (overview) cost statements from each beneficiary to be provided to Jane Porter (STFC)	Beneficiary leads	15 June
59	Summary cost statement to be provided to the Project Officer	Jane Porter	20 June
60	All Annual Open Workshop and Steering Committee meeting presentations to be provided to Volker Bothmer and Chris Perry	All presenters	15 June
61	Presentations from the Annual Open Workshop and the Steering Committee meeting to be placed on HELCATS website	Chris Perry	20 June
62	Assess early study and publication of key HI events to illustrate benefit of HI data for prediction (required by SWPC and Met Office)	Richard Harrison Jackie Davies	30 July
63	Do we expand the debate on associations following the discussion at UGOE? Do we want a 'standard' set of rules for associations?	Peter Gallagher	30 July
64	Should the HI catalogue include Earth-impact time?	Jackie Davies Jason Byrne	30 July
65	Consider ways of increasing the visibility of the project – more press releases, other stuff on website (gallery?)...	All	30 July