



# HELcats

UGOE contribution to WP 4

- MVA results and Source Regions

Volker Bothmer & UGOE Team

HELcats 2nd AM, 7 June 2016, Albena, Bulgaria





# UGOE input to WP4

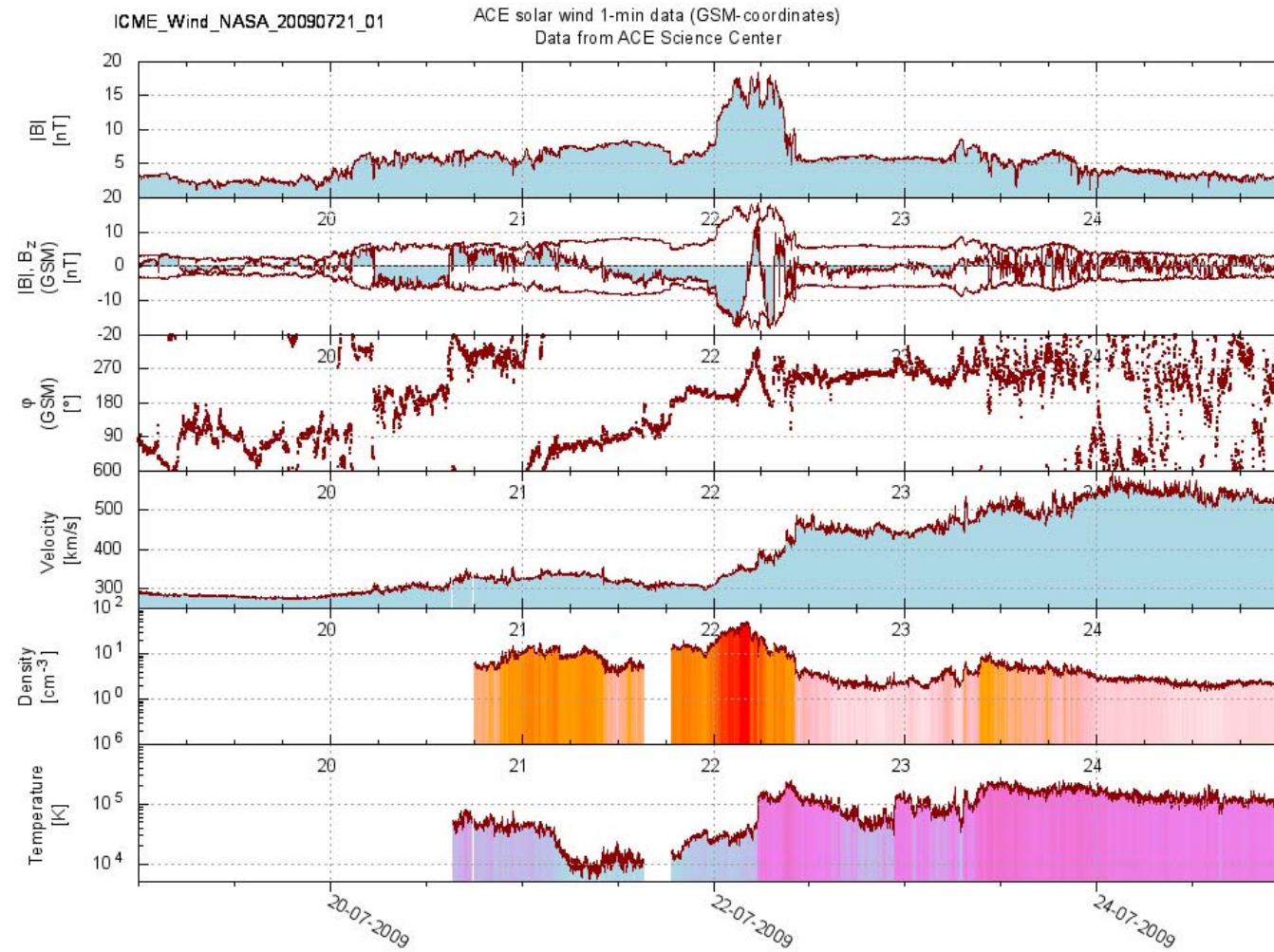
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- LINKCAT L1 ICME events investigated – 54 events
- 20 events did not qualify as ICMEs – rather CIRs or shocks only, or very disturbed B
- 30 ICMEs analyzed with MVA method (hourly averages and 64 s data)
- MVA plots and results sent to UNIGRAZ
- Source regions for LINKCAT established based on SOHO, SDO, STEREO, HEK data investigations





# Sample “non ICME event?” – HCS at CIR?

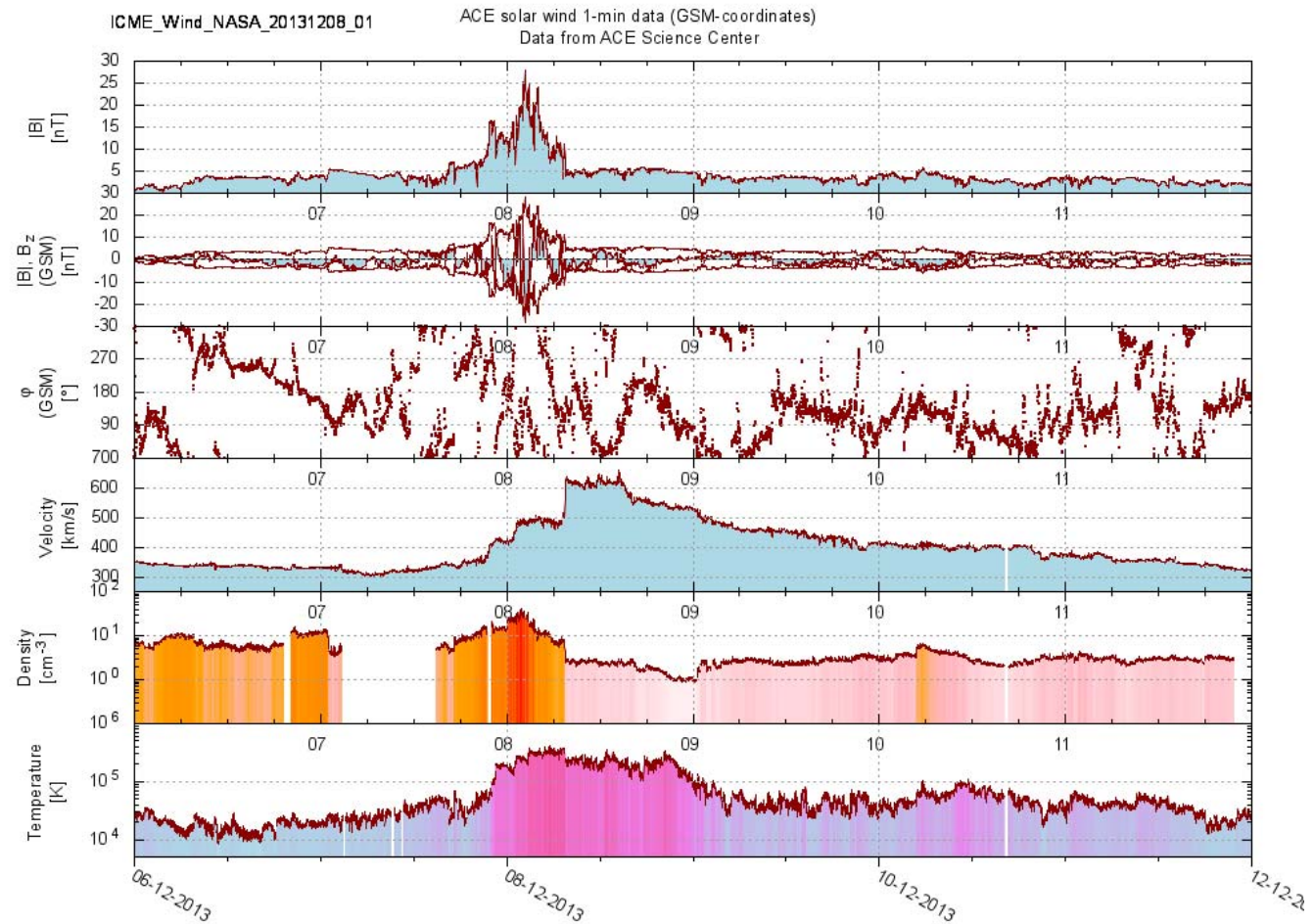


2016-01-20 18:41 CEST  
2016-01-20 17:40 UTC





# Sample non ICME event – CIR/Shock?

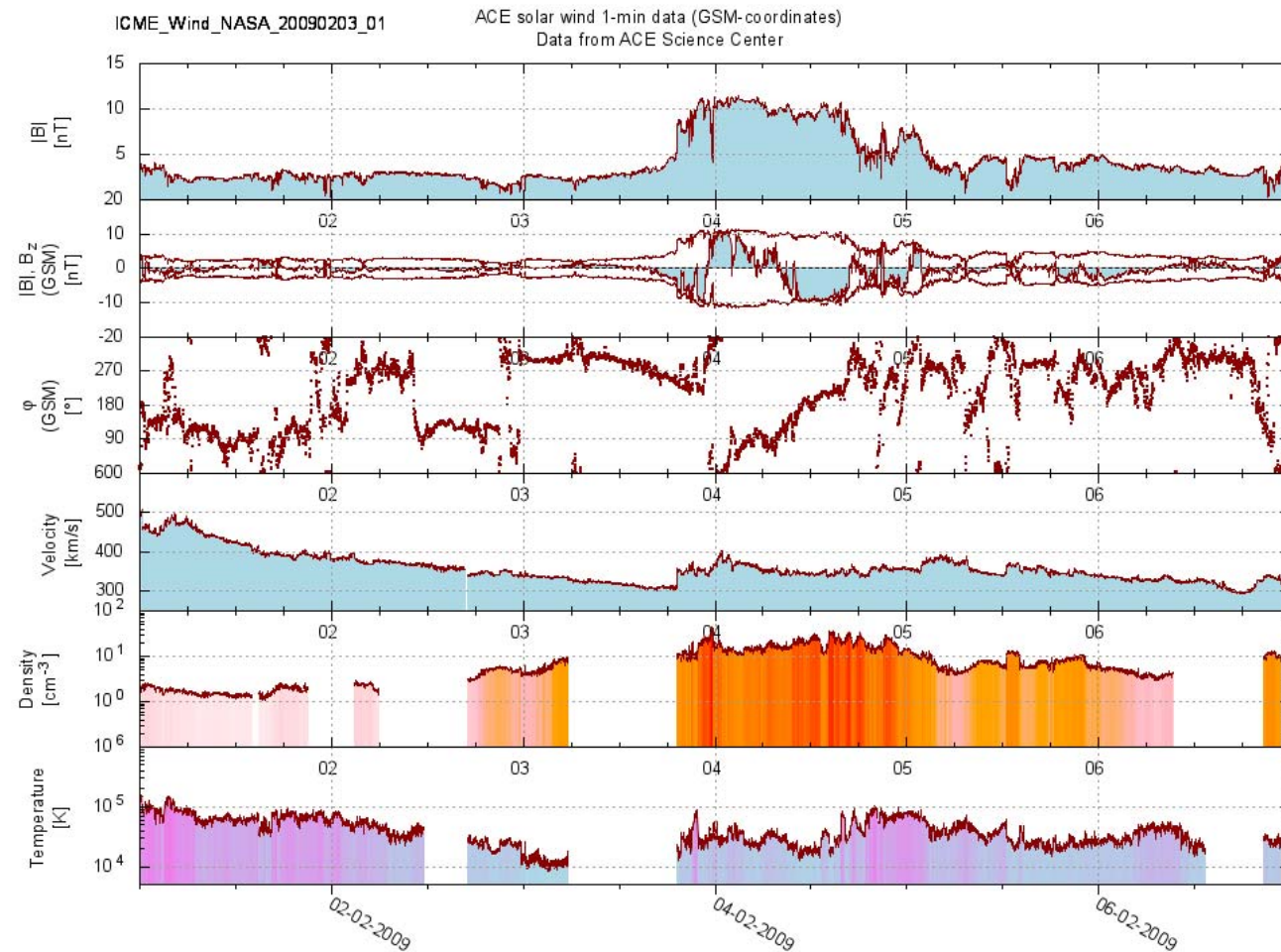


2016-01-21 13:10 CEST  
2016-01-21 12:10 UTC





# Classical ICME event in Feb. 2009, ACE data



2016-01-20 18:37 CEST  
2016-01-20 17:37 UTC





# MVA results

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MVA for MCS  
mva\_ace.pro  
Start time Tue Feb 23 14:46:58 2016

Date: 2009-02-04  
Duration (DOY): 035.00-035.67

Input data file: /home/astro71/apluta/ACE\_data/ACE\_MULTI\_1h\_2009.txt  
Output data file: MVA\_2009-02-04\_DOY\_035.00-035.67\_hodogram\_1h.ps

MVA values:

evec(0)	-0.91309212	-0.23996193	0.32966811
evec(1)	-0.40588330	0.61223149	-0.67855091
evec(2)	0.039006816	0.75338627	0.65642029
evec			
	-0.91309212	-0.23996193	0.32966811
	-0.40588330	0.61223149	-0.67855091
	0.039006816	0.75338627	0.65642029
eval	0.90075898	14.942592	58.624069
eval(1)/eval(2)	0.25488834		

EigenValMed/EigenValMin:	16.588890	
Phi and Theta min:	194.724	19.2486
Phi and Theta med:	123.543	-42.7305
Phi and Theta max:	87.0361	41.0274

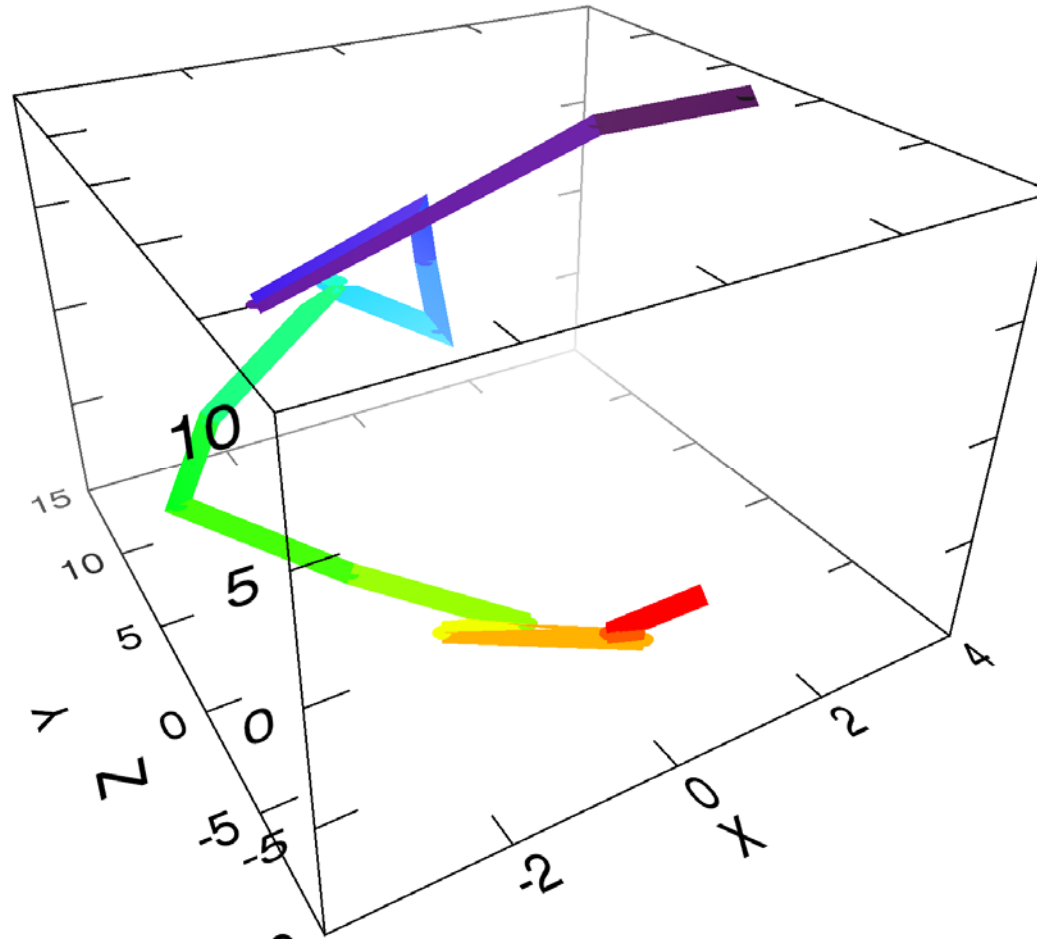
MVA triple product: -1.00000  
MVA helicity: left-handed **needs to be corrected**  
MVA MC type:  
MVA MC pass:





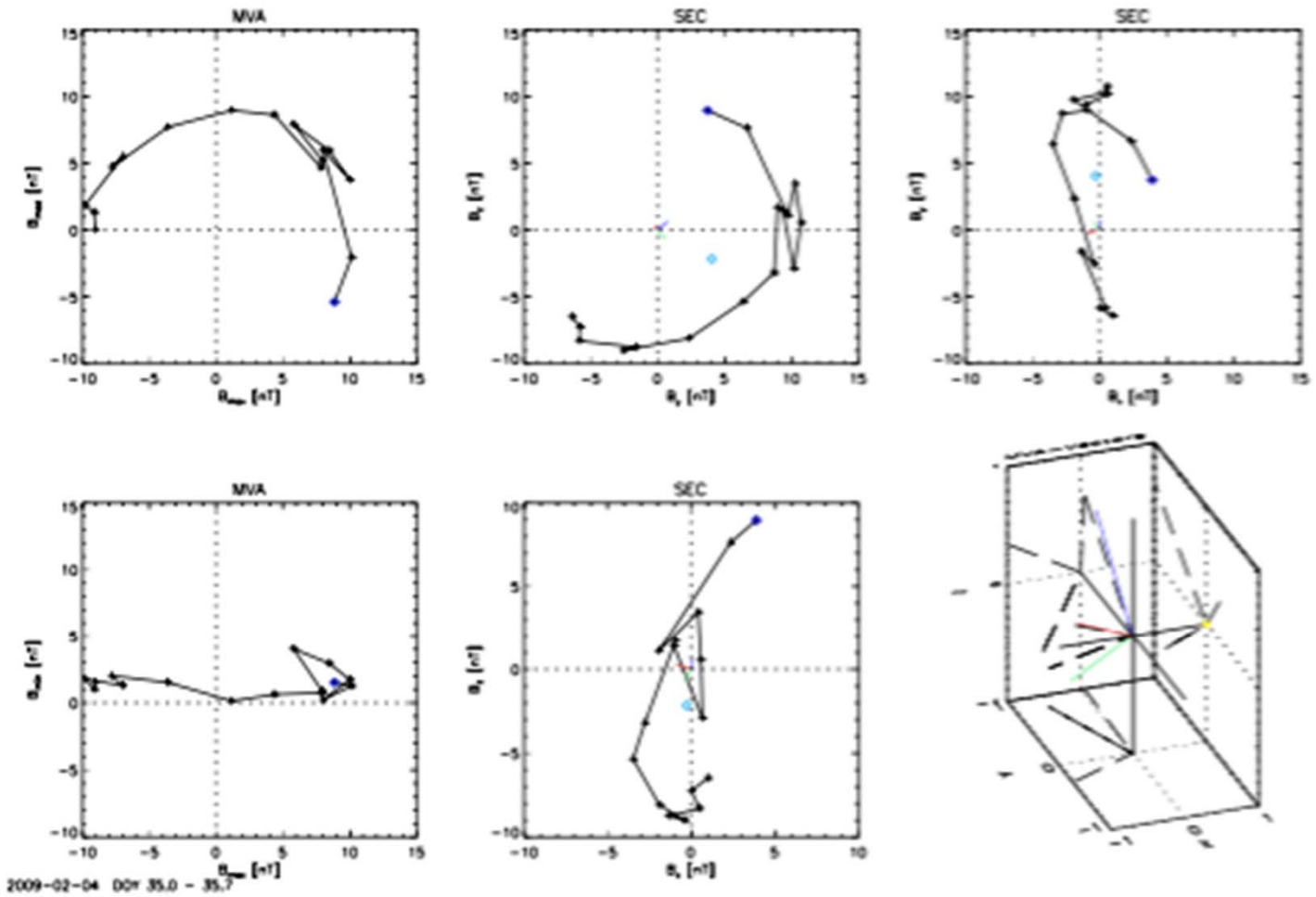
# Graphical Visualization

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# Graphical Visualization

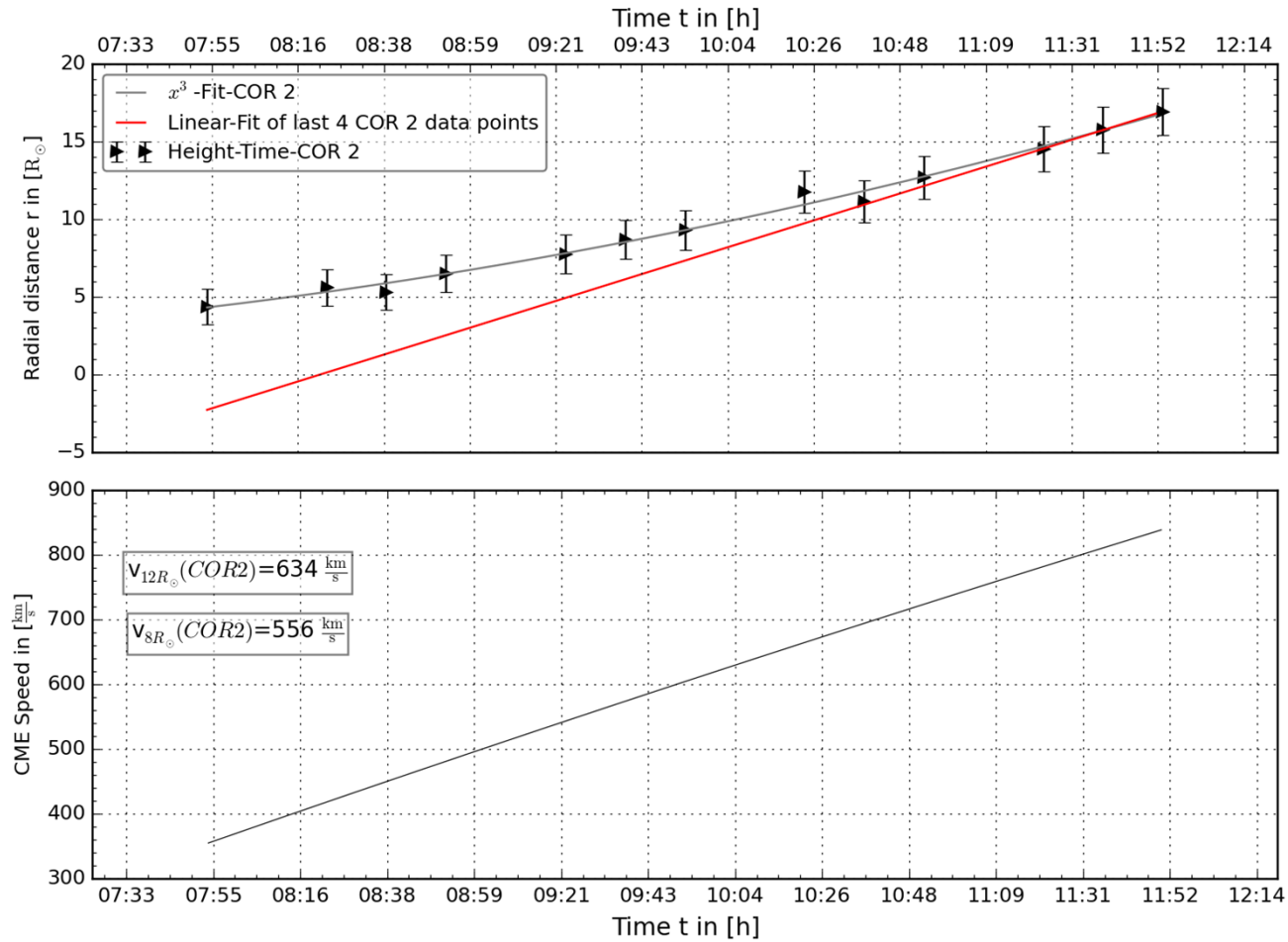






# SR identified for LINKCAT – Sample CME onset analysis, intermediate speed

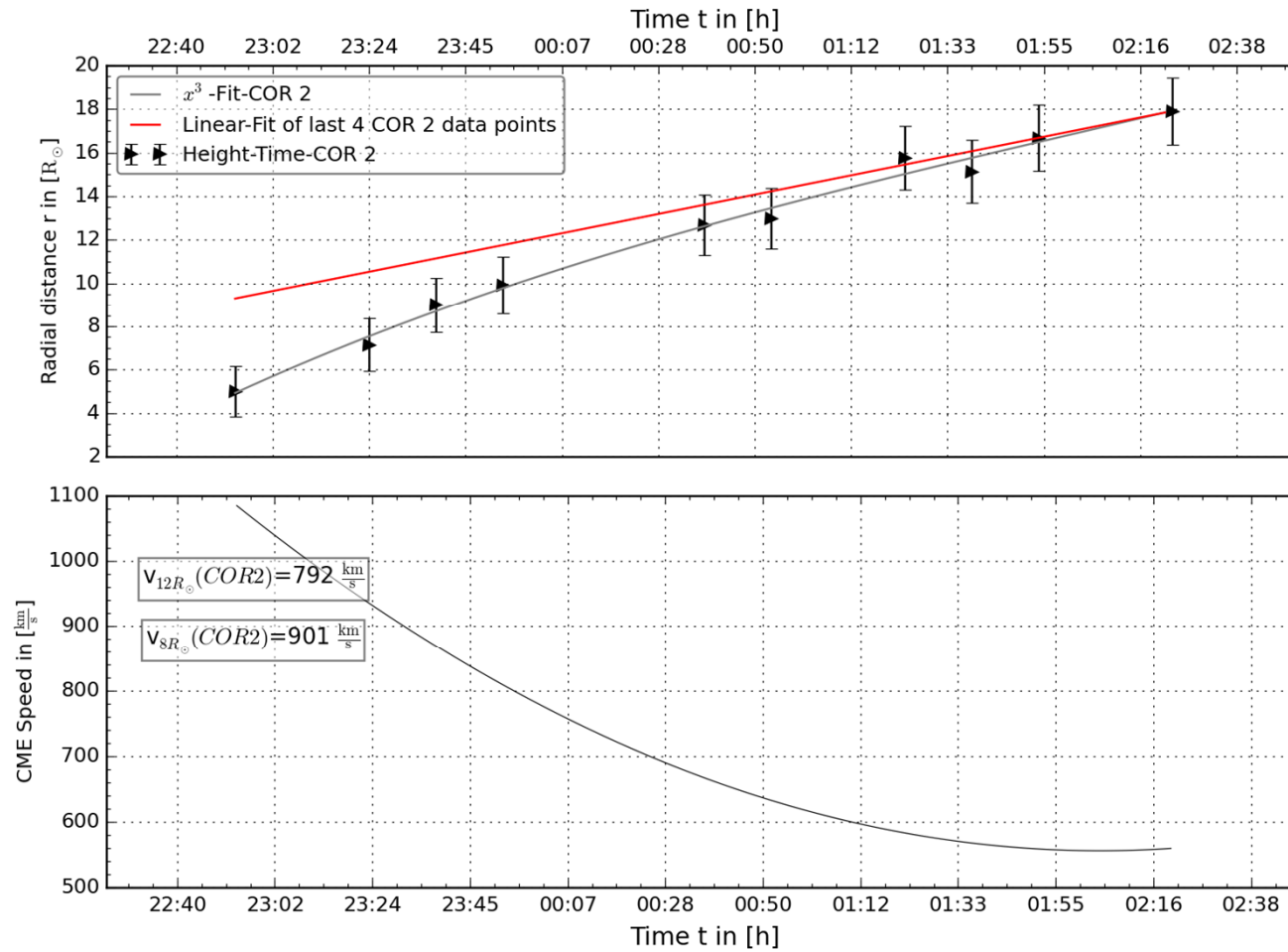
Event date: 2011-06-14





# SR identified for LINKCAT – Sample CME onset analysis, higher speed

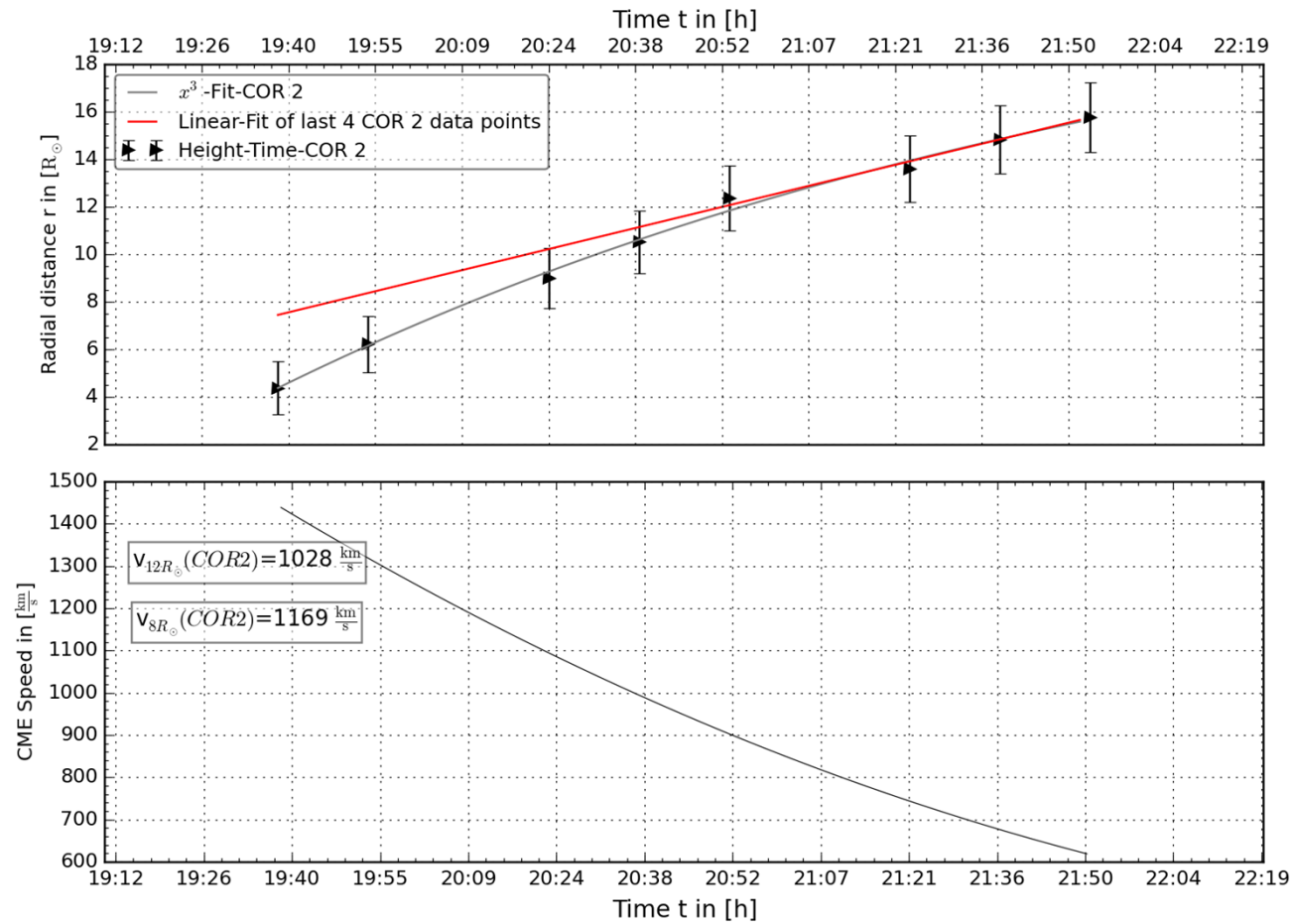
Event date: 2011-09-06





# SR identified for LINKCAT – Sample CME onset analysis, higher speed

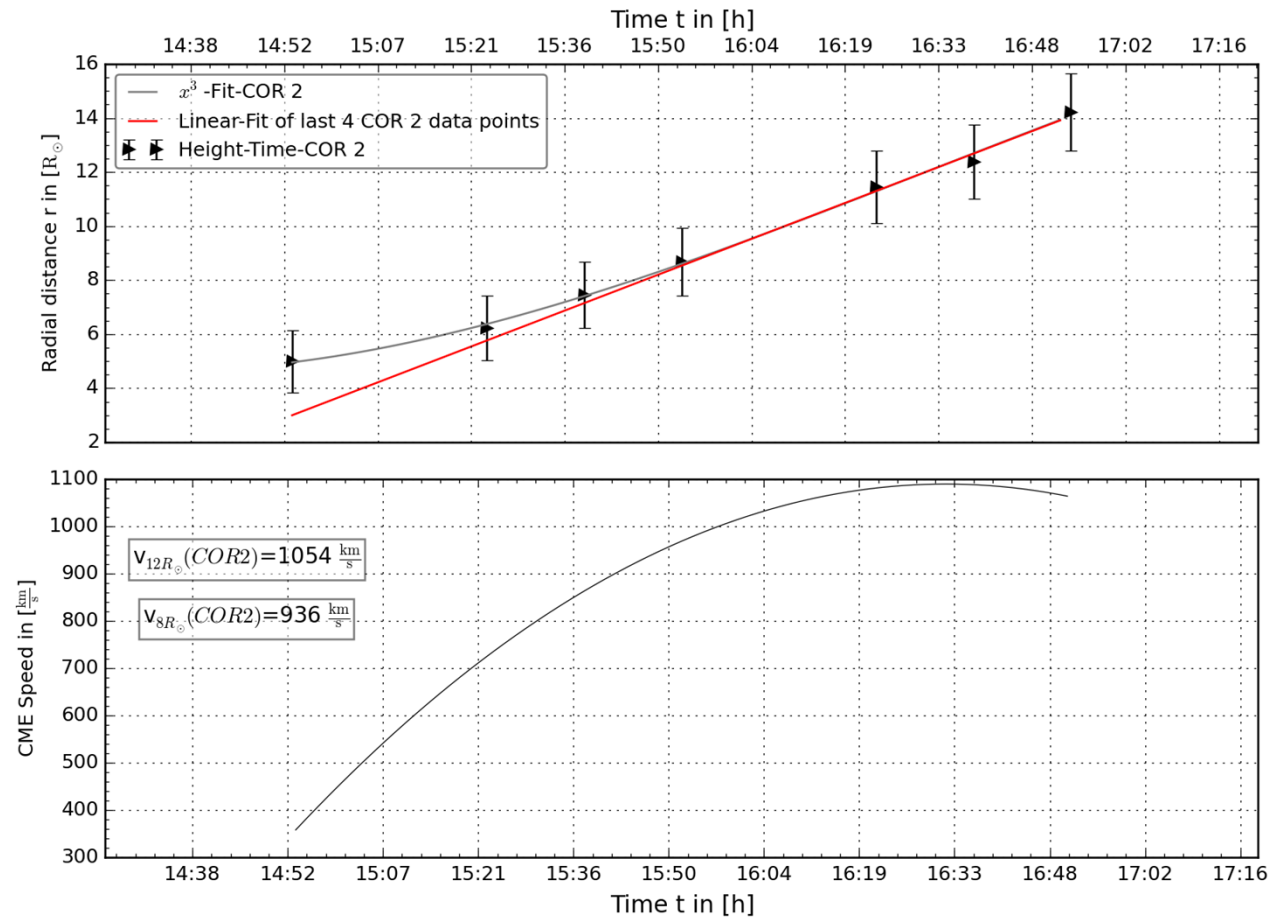
Event date: 2011-09-24





# SR identified for LINKCAT – Sample CME onset analysis

Event date: 2012-07-17





# Summary

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- **54 ICMEs in LINKCAT with L1 signatures investigated**
- **24 unclear or non ICME events identified**
- **MVA results provided to UNIGRAZ for 30 ICMEs, including an overall event list during time period 2008 – 2013**
- **Source regions identified for LINKCAT**
- **Onset analysis shows that there are for a number of events considerable deviations from HI and in-situ linear backtracking - needs to be taken into account in WP4 studies**

