

<b>Title</b>	Description of Version 1.0 of the Level 3 CHRIS/PROBA data from the Chilbolton test site, collected as part of the NCAVEO 2006 Experiment.
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<b>Date</b>	23 Feb 2007
<b>Revision history</b>	29 Jan 2007 first release 23 Feb 2007 correction to fly-by zenith angles and addition of 6E35 RMSE
<b>Purpose</b>	To describe the pre-processing steps applied to the CHRIS/PROBA data prior to release.
<b>Data files in the set</b>	CHRIS_CL_060617_6E32_41_cx1w CHRIS_CL_060617_6E33_41_cx1w CHRIS_CL_060617_6E34_41_cx1w CHRIS_CL_060617_6E35_41_cx1w CHRIS_CL_060617_6E36_41_cx1w
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<b>Terms of use</b> <b>(see NEODC website for the full version)</b>	<p>The data may be used for all non-commercial research/project work undertaken by the NCAVEO network, in particular to learn about cal-val issues.</p> <p>If you wish to use the data set please contact the PI listed above. If you intend to publish a paper or give a presentation based on, or making significant use of these data, please consider including the PI(s) as co-author(s) at an early stage in the process.</p> <p>In all cases where the data are used in a presentation or publication, an acknowledgement must be given: for example, "<i>Data from the NCAVEO 2006 Field Campaign are provided courtesy of NCAVEO via the NERC Earth Observation Data Centre (NEODC).</i>"</p> <p>Surrey Satellite Technology Ltd is the owner of all data directly resulting from in-flight operation of the CHRIS instrument flown on-board the ESA PROBA spacecraft. All publications on the CHRIS instrument or data obtained from the CHRIS development and/or operation shall make explicit reference to Surrey Satellite Technology Ltd, the CHRIS instrument and the ESA PROBA mission.</p>

This document refers to the CHRIS/PROBA data collected on 17<sup>th</sup> June 2006. CHRIS was operated in Mode 1, giving 62 spectral bands between 410.6 nm and 1003.2 nm, and a nominal ground resolution at nadir of 34 m. Details of the bands sensed and many other sensor/platform parameters can be found in the HDF file.

The quality of the data is generally good, although there are major problems with clouds and cloud shadows over the west of the area. Unfortunately, these affect many of the sites chosen for ground

measurements as well as the main ground calibration site at the Chilbolton Facility for Atmospheric and Radio Research (CFARR).

The data were affected by vertical striping and occasional corrupt lines, both known problems with CHRIS data. Both of these were corrected empirically, using version 1 of HDFClean, a program developed by SSTL and available from ESA. This successfully removed most of the errors, but also introduced additional vertical stripes in the area of the image affected by clouds. This is more serious in some bands than others. For some applications it may be preferable to use the raw data which is also available from NEODC.

Having destriped the data, the image was imported into ENVI 3.6 and subset to exclude a large area without valid data to the right of the main image, and also to exclude the first and last lines of the image, which were corrupted. The first six pixels of each line were also excluded as they were corrupted, resulting in an image 372 columns x 372 lines x 62 bands.

The CHRIS dataset comprises five images, each from a different fly-by location. The angles associated with each image are given in the HDF file and should be interpreted with reference to the papers cited at the end of this document. The individual images were registered to the Ordnance Survey Landline data using the conventional method of ground control points. This was successful for four of the view angles, but not for one of the extreme look angle images (6E35). The parameters chosen for the geometric correction are shown in the Table below.

Image :	6E32	6E33	6E34	6E35	6E36
Fly-by zenith angle :	0	36	-36	55	-55
RMS Error (pixels) :	0.49	0.35	0.41	0.48	0.79
Transformation :	First order polynomial				
Resampling :	Cubic convolution				
Output pixel size :	30 metres				
Map projection :	UK Ordnance Survey				
Datum :	OSGB36				

## Related references

Alonso, L. and J. Moreno, 2004, Quasi-automatic geometric correction and related geometric issues in the exploitation of CHRIS/PROBA data. *In* Proceedings of the 2nd CHRIS/Proba Workshop. ESA, ESA/ERSIN, Frascati, Italy.

García, J.C. and J. Moreno 2004. Removal of noises in CHRIS/PROBA images: application to the SPARC campaign data. *In* Proceedings of the 2nd CHRIS/Proba Workshop. ESA, ESA/ERSIN, Frascati, Italy.

Note : Proceedings of the Annual ESA Chris Proba Workshops are available from:  
<http://earth.esa.int/workshops/>

Guanter, L., L. Alonso and J. Moreno 2005. A method for the surface reflectance retrieval from PROBA/CHRIS data over land: application to ESA SPARC Campaigns. *IEEE Transactions on Geoscience and Remote Sensing*. 43:2908-2917.

Davidson, M. and Vuilleumier, P., Undated. Notes on CHRIS acquisition procedure and image geometry. Available from:  
[http://earth.esa.int/pub/ESA\\_DOC/CHRIS\\_acquisition-procedure\\_image-geometry\\_rev1\\_3.pdf](http://earth.esa.int/pub/ESA_DOC/CHRIS_acquisition-procedure_image-geometry_rev1_3.pdf)