BGWG blank sky updates and pn soft proton analysis

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Palermo,11/04/07

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Status at end of last meeting Mallorca Oct 2006

- Files released.

- Paper submitted – additional section on file reliability being worked on

- File issues:

  1. Jean Ballet

  2. Hubert Chen

  3. Dong Woo Kim

- Plans for future work, action items

  - Selector tool, ghosting tool, comment on filtering used on website, comment on recommended use of refilled/unfilled files
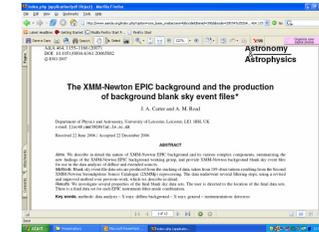
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Current status, April 2007

- Files being used, comments coming in
- Paper published: A&A, 464, 1155, 2007
- File issues – dealt with individually
- Selector tool - trial in java can't be scaled up due to large FITS files.
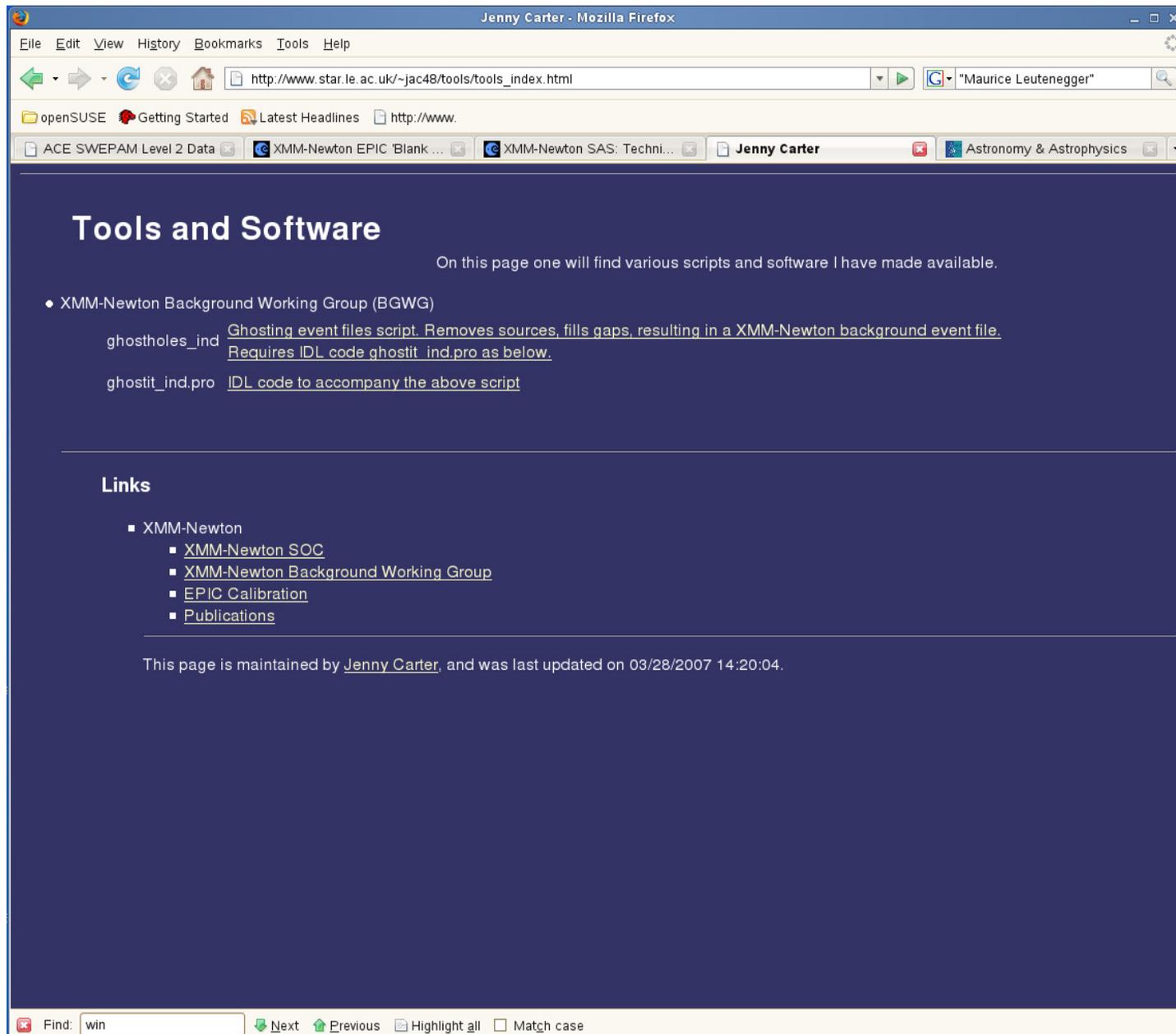- Ghosting tool – available on web already:
  - http://www.star.le.ac.uk/~jac48/tools/

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Blank sky paper

- Aims. We describe in detail the nature of XMM-Newton EPIC background and its various complex components, summarising the new findings of the XMM-Newton EPIC background working group, and provide XMM-Newton background blank sky event files for use in the data analysis of diffuse and extended sources.

- Methods. Blank sky event file data sets are produced from the stacking of data, taken from 189 observations resulting from the Second XMM-Newton Serendipitous Source Catalogue (2XMMp) reprocessing. The data underwent several filtering steps, using a revised and improved method over previous work, which we describe in detail.

- Results. We investigate several properties of the final blank sky data sets. The user is directed to the location of the final data sets. There is a final data set for each EPIC instrument-filter-mode combination.

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Blank sky web page

- Updates marked as before

- Completed Action Items:
  - BG_WG_04_03; DATE_OBS keywords discussion
  - BG_WG_04_04; comment on filtering and selection expression on web page

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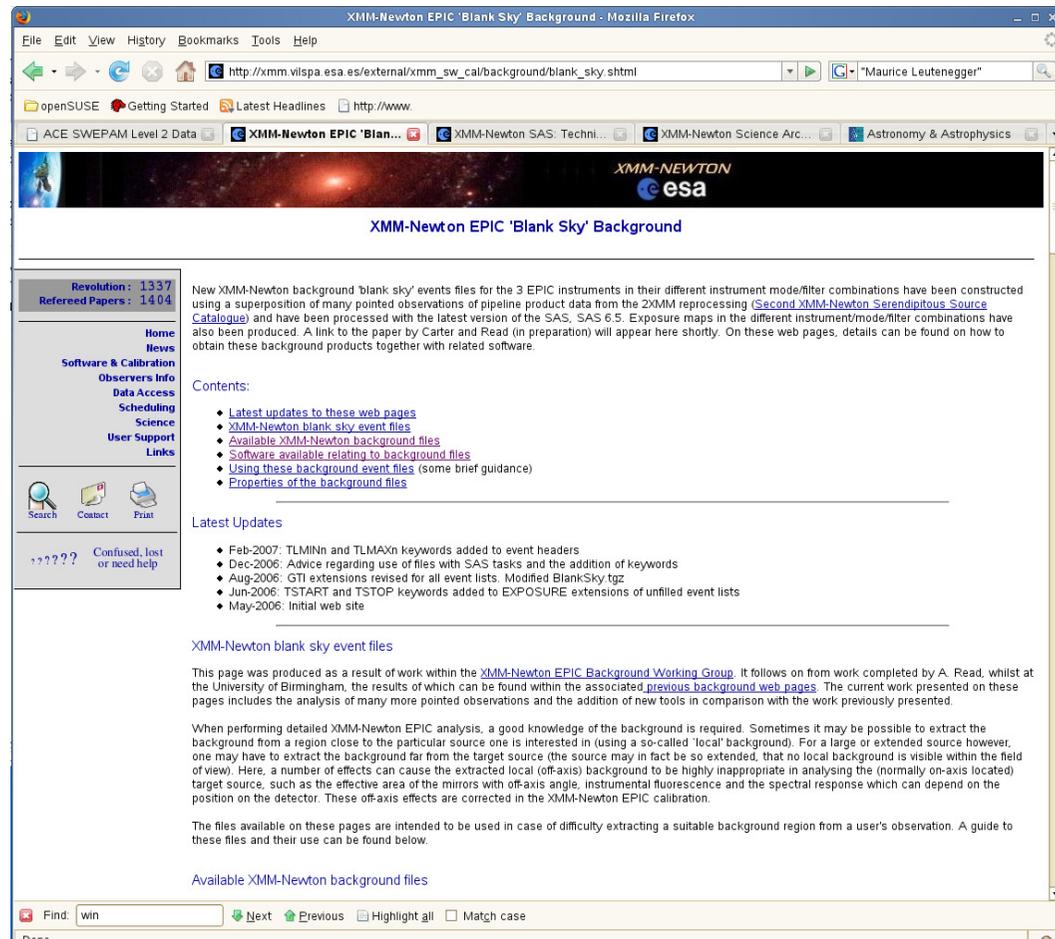
Individual queries (1) - completed

- Hubert Chen – 100eV shift in spectra when using evselect and no parameters specified (ok if default values stated explicitly), corrected by adding keywords (removed using FTOOLS fmerge), TLMINn, TLMAXn.

- Dong Woo Kim – Flaring still seen, query about selection expression. Informed of expression and comment added to webpage.

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Individual queries (2)

- Jean Ballet

1. Offset between count maps and exposure maps, MOS.

2. Row in PN exp. maps, LIVETIME > value in header.

3. PN default options for exposure maps, requests flag included, (FLAG&0x2fb002c) == 0. Files available at:
   http://www.star.le.ac.uk/~jac48/BG/NewExposures/

4. Some Blank Sky unfilled files showing annulus 0.5 – 2keV. Identified culprit observations, removed, files available at:

   http://www.star.le.ac.uk/~jac48/BG/jb/

- Michael Bauer

- Skycast and blank sky files. If use attcalc more than once then on using task backscale, the backscale keyword is 0.

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Outstanding action plans/other plans

- BG_WG_03_03: Advice on when to use refilled/unfilled
- BG_WG_04_05: Selection tool, web based. Sketched out html/CGI script tool. Currently on hold.
- BG_WG_04_06: Individual users ghosting script. Available for testing through my pages. Needs link/upload to ESAC page
- Improved ghosting, re-release, replace current exp. maps with those with Jean Ballet flags, re-release files with larger source exclusion region
- Sort out Bauer problem, other selection tools if worthwhile, dataset increase

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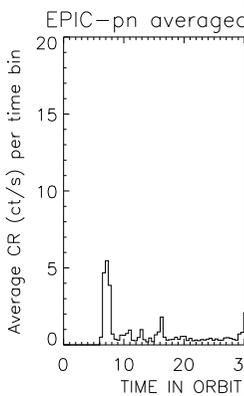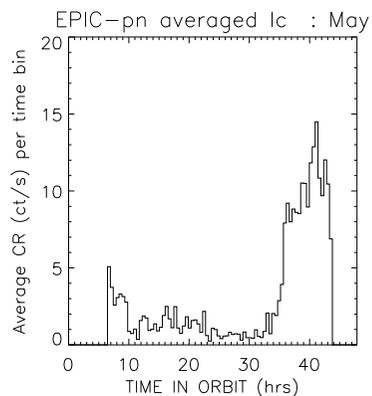5th EPIC BG WG Meeting
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PN soft proton flaring

- Similar to Kip's work regarding the MOS

- Plan:
  - Process pn event lists for all mission
  - Produce lightcurves and orbit files
  - Look at the high energy count rates with position in orbit

    - Currently processed revns. 400 - 600

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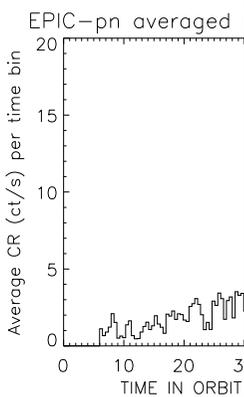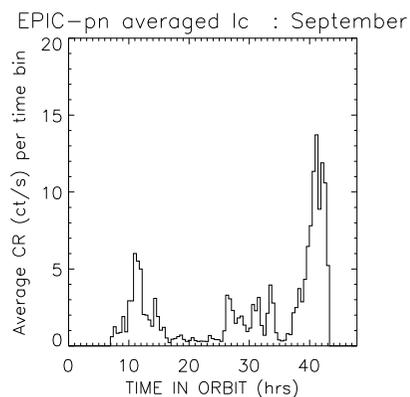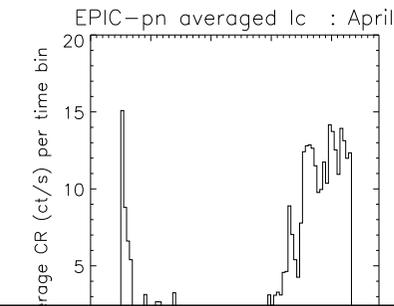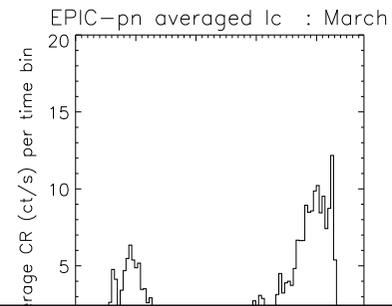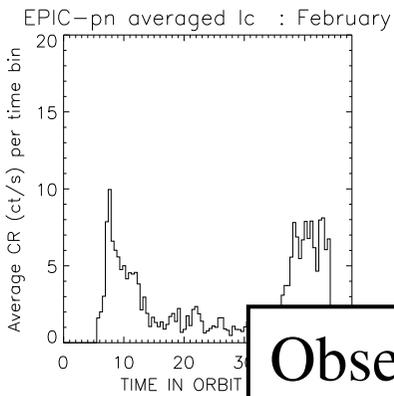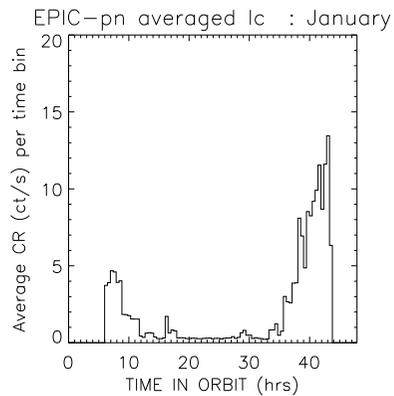
Observations

• Quite dramatic increase going into radiation belts

• Activation curve coming out of belts

• Less winter/summer effect than expected?

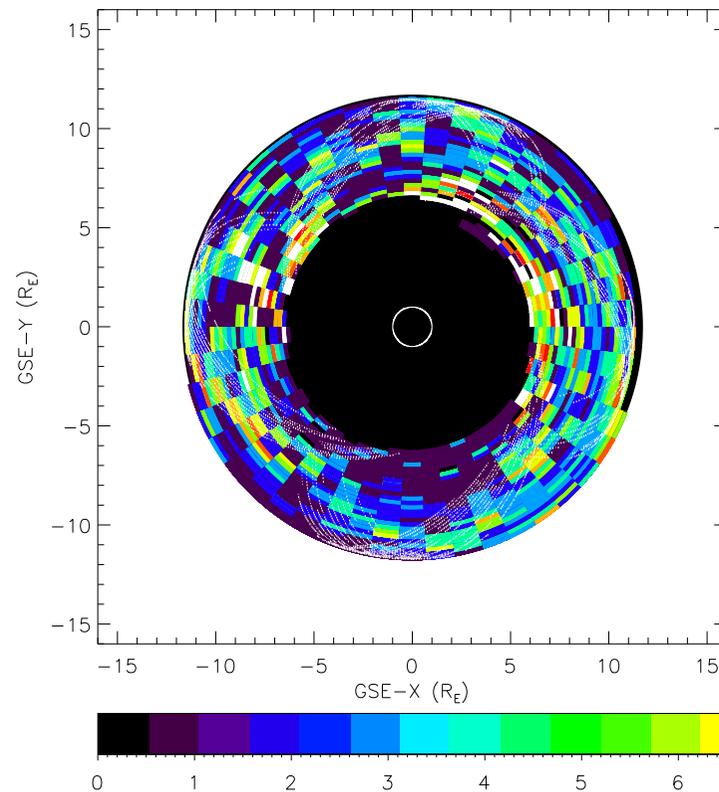• Generally winter months quieter mid-orbit, see Dec/Jan

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- Orbits calculated in GSE coordinates – Geocentric Solar Ecliptic (Earth at centre, x-axis towards Sun, y-axis opposite Earth motion, z-axis perpendicular to ecliptic plane)
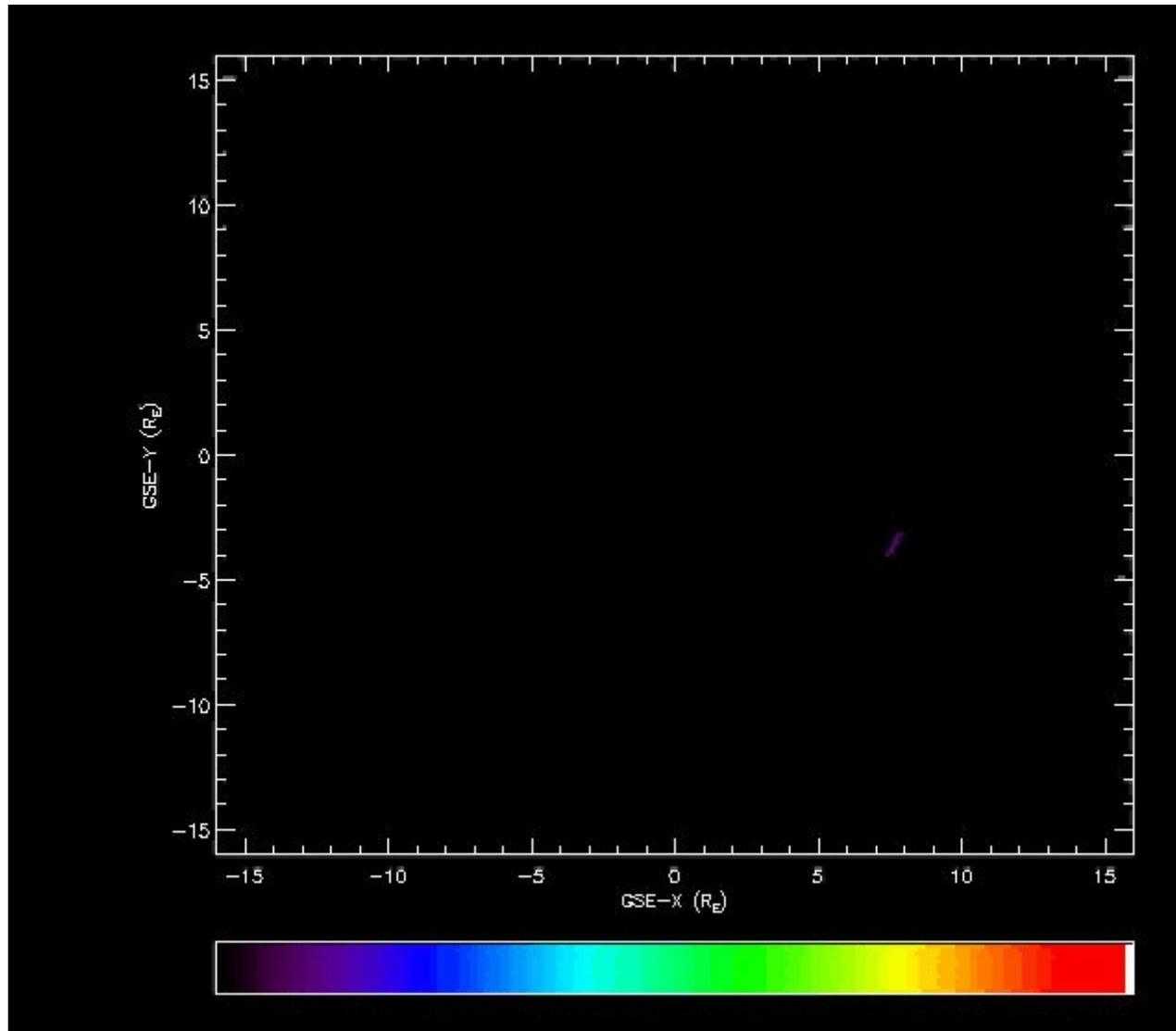
- General plot below, count rate threshold 2.0

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Other ideas and plans

- ASPANGLE and count rate
- Temperature of the camera with count rate

- Possibly useful for future missions, e.g. Simbol-X as following same sort of orbit as XMM (20,000 km - 180,000 km, 4 day orbit, hard X-rays, 3 yrs + 2 yrs, planned calibration going into perigee)

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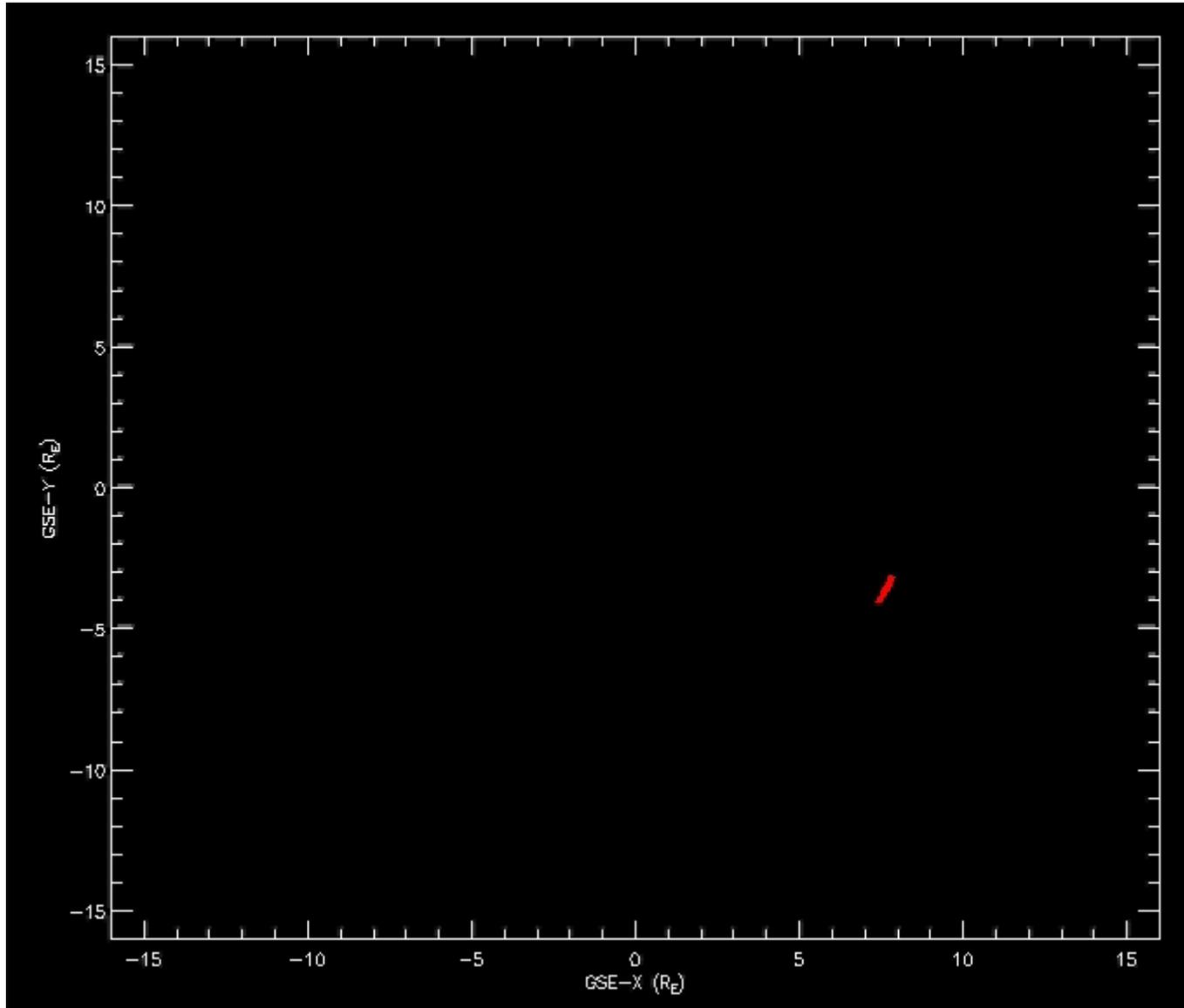**University** *of*
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