**SNR G292.0+1.8**

1. **Summary**
   - Distance: 4.8 kpc (Saken et al., 1992)
   - Position of Central Source (J2000): (11 24 33.9, -59 15 40.4)
   - X-ray size: 9.2'x8.8'
   - Description:

1.1 **Summary of Chandra Observations**

<table>
<thead>
<tr>
<th>Sequence</th>
<th>Obs ID</th>
<th>Instrument</th>
<th>Exposure_{uf} (ks)</th>
<th>Exposure_{f} (ks)</th>
<th>Date Observed</th>
<th>Aimpoint (J2000) (α, δ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500013</td>
<td>126</td>
<td>ACIS-35678</td>
<td>43.6</td>
<td>43.6</td>
<td>2000-03-11</td>
<td>(11 24 40.0, -59 16 30.0)</td>
</tr>
</tbody>
</table>

- \( \text{Exposure}_{uf} \rightarrow \text{Exposure time of un-filtered event file} \\
- \( \text{Exposure}_{f} \rightarrow \text{Exposure time of filtered event file} \\
- Most of the remnant is covered by chip ACIS-S3 (CCD ID=7)

1.2 **Chandra Counts and Fluxes**

<table>
<thead>
<tr>
<th>Region</th>
<th>Energy Range</th>
<th>Signal Rate</th>
<th>(-\text{F}_\text{X}^0) (counts)</th>
<th>(-\text{F}_\text{X}) (ergs cm(^{-2}) s(^{-1}))</th>
<th>(-\text{L}_\text{X}) (ergs s(^{-1}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.3 - 10.0</td>
<td>2.869e+06</td>
<td>6.80e+01</td>
<td>2.26e-10</td>
<td>2.09e-09 57.3e+36</td>
</tr>
<tr>
<td>(126)</td>
<td>0.3 - 2.1</td>
<td>2.778e+06</td>
<td>6.370e+01</td>
<td>1.80e-10</td>
<td>2.04e-09 5.60e+36</td>
</tr>
<tr>
<td>2.1 - 10.0</td>
<td>9.279e+04</td>
<td>2.128e+00</td>
<td>4.63e-11</td>
<td>4.94e-11</td>
<td>1.36e+35</td>
</tr>
</tbody>
</table>

- \( \text{NH} = 0.62 \ \text{(10}^{22} \text{cm}^{-2}) \)
- Assumed distance: 4.8 kpc (Saken et al., 1992)
- aH was derived with two thermal plasma model

1.3 **Nearby Sources**

<table>
<thead>
<tr>
<th>Obs ID</th>
<th>Position (J2000)</th>
<th>Size (arcsec)</th>
<th>Net Count</th>
<th>Count Rate</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>(11 23 33.1, -59 18 08.6)</td>
<td>&lt; 16.7’’</td>
<td>694.0</td>
<td>1.6e-02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 23 47.3, -59 18 34.5)</td>
<td>&lt; 11.9’’</td>
<td>558.0</td>
<td>1.2e-02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 24 16.1, -59 12 01.9)</td>
<td>&lt; 6.0’’</td>
<td>236.0</td>
<td>5.4e-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 24 25.2, -59 23 19.6)</td>
<td>&lt; 9.3’’</td>
<td>279.0</td>
<td>6.4e-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 24 47.1, -59 11 37.3)</td>
<td>&lt; 3.8’’</td>
<td>93.6</td>
<td>2.1e-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 24 48.6, -59 11 35.1)</td>
<td>&lt; 3.6’’</td>
<td>55.0</td>
<td>1.2e-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 00.7, -59 14 17.7)</td>
<td>&lt; 1.2’’</td>
<td>29.0</td>
<td>6.6e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 03.7, -59 19 24.0)</td>
<td>&lt; 3.4’’</td>
<td>63.5</td>
<td>1.4e-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 04.4, -59 11 41.9)</td>
<td>&lt; 3.7’’</td>
<td>34.8</td>
<td>7.9e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 04.4, -59 17 17.8)</td>
<td>&lt; 1.8’’</td>
<td>113.0</td>
<td>2.5e-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 05.5, -59 13 41.6)</td>
<td>&lt; 2.3’’</td>
<td>24.6</td>
<td>5.6e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 05.6, -59 14 21.7)</td>
<td>&lt; 2.2’’</td>
<td>24.3</td>
<td>5.5e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 06.8, -59 15 19.9)</td>
<td>&lt; 1.3’’</td>
<td>21.4</td>
<td>4.9e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 09.7, -59 14 04.2)</td>
<td>&lt; 2.5’’</td>
<td>17.8</td>
<td>4.0e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 11.4, -59 14 24.9)</td>
<td>&lt; 3.0’’</td>
<td>41.0</td>
<td>9.4e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 12.4, -59 13 54.4)</td>
<td>&lt; 3.0’’</td>
<td>22.0</td>
<td>5.0e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 14.2, -59 14 56.1)</td>
<td>&lt; 2.1’’</td>
<td>47.0</td>
<td>1.0e-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 14.9, -59 13 33.5)</td>
<td>&lt; 2.3’’</td>
<td>30.2</td>
<td>6.9e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 18.8, -59 13 25.3)</td>
<td>&lt; 3.4’’</td>
<td>49.0</td>
<td>1.1e-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 23.6, -59 16 31.0)</td>
<td>&lt; 2.9’’</td>
<td>39.5</td>
<td>9.0e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 23.3, -59 17 05.0)</td>
<td>&lt; 3.4’’</td>
<td>45.4</td>
<td>1.0e-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 33.0, -59 17 08.5)</td>
<td>&lt; 5.2’’</td>
<td>48.1</td>
<td>1.1e-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 35.4, -59 15 38.4)</td>
<td>&lt; 5.9’’</td>
<td>41.7</td>
<td>9.5e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 42.1, -59 16 49.6)</td>
<td>&lt; 6.7’’</td>
<td>40.9</td>
<td>9.3e-04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 51.7, -59 11 50.9)</td>
<td>&lt; 9.3’’</td>
<td>49.3</td>
<td>1.1e-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 25 56.3, -59 12 35.1)</td>
<td>&lt; 12.1’’</td>
<td>44.9</td>
<td>1.0e-03</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(note) 1. This nearby source list is incomplete. All the above sources are originally from the "src2.fits" file which is distributed with standard chandra processing. Only sources with significant count rate and which are clear to visual inspection are included. 
2. The size given above is the size of the region used in detecting that source. 
3. For each source, background was subtracted from annular region around the source.

1.4 **References**

- Saken et al., 1992 ApJS, 81, 715:
2 Fit Detail

- See spectrum page for used regions.

2.1 Total:
- Two thermal plasma model
- Abundance of O, Ne, Mg, Fe are thawed and linked.

\[ \text{source} = (\text{xswabs} \times (\text{xsvraymond} + \text{xsvraymond}) + \text{powlaw1d}) \]
\[ \text{reduced } \chi^2 = 56.0551 \]
\[ \text{nh} = 0.6156 \times 10^{22}/\text{cm}^2 \]

2.2 Total:
- With above fitted model freezed, powe-law component was added for better estimation of hard energy flux.

\[ \text{source} = (\text{xswabs} \times (\text{xsvraymond} + \text{xsvraymond}) + \text{powlaw1d}) \]
\[ \text{reduced } \chi^2 = 45.8752 \]
\[ \text{nh} = 0.6156 \times 10^{22}/\text{cm}^2 \]

3 Chandra Images : Band Images

- Left : raw image, binned by 1x1 pixel
- Right : gaussian smoothed version of above (σ = 2 pixel)

3.1 Wide Band Images

**Total : 300-10000 eV**

- SoftBand:300-2100 eV
- HardBand:2100-10000 eV
3 CHANDRA IMAGES : BAND IMAGES

3.2 Band images used in true color image.

Red : 300-800 eV

Green : 800-1660 eV

Blue : 1660-8000 eV
3.3 Misc.

: 560-720 eV

: 960-1120 eV

: 840-960 eV

: 1230-1400 eV
4 Chandra Images: True Color

- Individual images are adaptively smoothed.
- Warning: the adaptive smoothing process sometimes produces artifacts.
- Convolution method: fft
- Kernel type: gauss
- Significance (min, max): (3, 5)

Red: 300-800 eV
Green: 800-1660 eV
Blue: 1660-8000 eV
5 Chandra Images: Equivalent Width Map

5.1 Equivalent Width Images

- Individual images (line and two continuum) are binned by given pixel size and then adaptively smoothed.
- Same scale map (from the least count images) was used for all three images.
- Continuum at given line position was estimated by linear interpolation of two continuum images in pixel-by-pixel base.

\[
\begin{array}{ccc}
\text{continuum:} & 400-510 \text{ eV} & \\
\text{line:} & 530-710 \text{ eV} & \\
\text{continuum:} & 730-820 \text{ eV} & \\
\end{array}
\]

\[
\begin{array}{ccc}
\text{continuum:} & 740-850 \text{ eV} & \\
\text{line:} & 980-1100 \text{ eV} & \\
\text{continuum:} & 1120-1200 \text{ eV} & \\
\end{array}
\]
6 Chandra Spectrum

- Images show Regions used to extract spectra
- Regions with red strikes are excluded

6.1 ObsID 126

- Background was subtracted from the region around the SNR.
7 Images from Survey Missions

- Left: Chandra Image (0.3-10. keV)
- Center: Images from SkyView with the same scale
- Right: Images from SkyView with a reduced scale

ROSAT PSPC (2.0 deg): X-ray (0.1-2.4 keV)

IRAS 60 micron: Infrared (60 micron)

IRAS 100 micron: Infrared (100 micron)

CO survey: Radio (115 GHz)

4850 MHz: Radio (4850 MHz continuum)
Digitized Sky Survey: Optical (J or E band images with a few exceptions)