GBT Observations of Extra-Galactic Neutral Hydrogen

Ashley Zauderer, Ting Yan, Erica Nelson

Advisor: Frank Ghigo, NRAO
Our six minutes

1. Sample Selection
2. Observing Remotely with Green Bank
3. Data reduction
4. Post-reduction analysis
5. Conclusions/Things we learned
6. Future work
Our Galaxies!

UGC 7711

UGC 7215

UGC 7993

Mrk 273

Mrk 231

3C 258
Spiral Galaxies
Data Reduction
Scan 11 V : 2307.0 OPTIC - BAR F0 : 1.42040 GHz Pol: YY Tsys: 15.84
2009-07-13 Int : 00 04 46.6 Fsky : 1.40943 GHz IF : 0 Tcal: 1.46
SD Summer School LST : +12 29 04.4 BW : 12.5000 MHz AGBT09A_096_03 OnOff
12 33 39.74 +09 10 30.1 ugc7711 Az: 177.4 El: 60.8 HA: -0.08
Luminous Infrared Galaxies
Merging/Interacting Systems
Higher Redshift Galaxy
<table>
<thead>
<tr>
<th>Galaxy</th>
<th>Integrated Flux</th>
<th>Velocity Width</th>
<th>$D$</th>
<th>radius</th>
<th>Mass of Hydrogen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[Jy * km/s]</td>
<td>[km/s]</td>
<td>[Mpc]</td>
<td>[arcmin]</td>
<td>[solar masses]</td>
</tr>
<tr>
<td>UGC 7215</td>
<td>53.1</td>
<td>273</td>
<td>18.97</td>
<td>5.5'</td>
<td>4.50E+009</td>
</tr>
<tr>
<td>UGC 7993</td>
<td>10</td>
<td>352</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>UGC 7711</td>
<td>5.4</td>
<td>244</td>
<td>17.2</td>
<td>4.2'</td>
<td>3.78E+008</td>
</tr>
</tbody>
</table>

Measured

Values obtained from literature

Calculated
Things that we learned:

-Making figures takes longer than anything else!

-RFI is not always deadly. It is useful to carefully look thru all of the data to identify if only portions are affected

-the power of IDL combining pre-written programs with our own needs

Future work:

-Observe the nondetections for longer time

-For galaxies with spectral lines near variable RFI use shorter integration times to flag the bad records

-Calculate hydrogen mass, total mass, column density, opacity (absorption profiles) and compare with data in the literature