The Solar Eclipse QSO Party: Ionospheric Sounding Using Ham Radio QSOs

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We love to operate!
Reverse Beacon Network

- Volunteer Network
- ~130 Nodes
- Data back to 2009
RBN & a Solar Flare

[NASA SDO]

[Frissell et al., 2014, Space Weather]
### Big Data – Other Ham Networks

<table>
<thead>
<tr>
<th>Network</th>
<th>Start Year</th>
<th># Spots</th>
<th>DB Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSPRNet</td>
<td>2008</td>
<td>535,000,000</td>
<td>44 GB</td>
</tr>
<tr>
<td>RBN</td>
<td>2009</td>
<td>578,000,000</td>
<td>36 GB</td>
</tr>
<tr>
<td>PSKReporter</td>
<td>2013</td>
<td>1,000,000,000</td>
<td>100 GB</td>
</tr>
</tbody>
</table>

- There is A LOT of data.
- This is not a “traditional” experiment.
- We are currently looking at ways to improve existing techniques and develop ones.
Solar Eclipse Ionospheric Effects?

Model Electron Density at ~280 km alt. during 1999 Eclipse
M. Harris from *Bamford* 2000.

Figure: M. Moses after *Afraimovich et al.*, 2002
SEQP Objectives

Let’s flood the HF airways with signals!!!

By generating lots of QSOs, we should be able to “image” ionospheric changes.
Solar Eclipse QSO Party (SEQP)

• August 21, 2017 from 1400 – 2200 UT

• Contest-like
  • 2 Points CW or Digital
  • 1 Point for Phone
  • Multiply Score by # of Grids

• Exchange
  • Real RST + 6 Character Grid Square

• Data sources
  • Reverse Beacon Network
  • PSKReporter
  • WSPRNet
  • Participant-submitted logs

http://hamsci.org/seqp
Bonus Points

• Operate during totality – 100 pts
• Operate outdoors (so you can see the eclipse) – 100 pts
• Operate at a public venue – 100 pts
• Provide detailed station operation info – 50 pts each:
  • Antenna design characteristics
  • HFTA terrain profile.
  • Estimated Ground conductivity
  • Station Effective Radiated Power relative to a Dipole (ERPD) on each band.

• Operate a wideband RBN, PSKReporter, or WSPRNet node during the contest – Varying Pt Values

• Bonus points for being spotted by RBN, PSKReporter, and Spotting Network.
Logging & Certificates

• We expect an N1MM+ module to be available for the SEQP.
• Any logging software that supports the ARRL VHF contest exchange format can also be used.
• Follow instructions at hamsoci.org/seqp for uploading logs.
• Downloadable participation certificate will be available.
• Final scores (with bonuses) will be posted on hamsoci.org.
Closure

• The data from these efforts will help both science and ham radio.

• I hope everyone will have a chance to participate in Solar Eclipse and the SEQP.

• The SEQP is just one way to help out! Stop by the HamSCI booth or visit hamsci.org/eclipse to learn more.

• We have a great opportunity to enjoy our ham radio hobby, experience the beauty of nature, and contribute to science!
Thank you!