Investigating Candidate Pulsars Using the GBT

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Our team, Lyne , was a group of all girls from all over West Virginia, Ohio, Kentucky, and even Texas. Our assignment was to look through the PSC Database to find possible pulsar candidates to look at using the GBT, Green Bank Telescope.

After studying plots and learning all about pulsars here is what we found .

A pulsar is a rotating neutron star that emits radio waves in periodic pulses. They are created when a star reaches the end of its life and can't support itself against its own gravity. Then its layers collapse and leave a neutron star, or pulsar.

The method we used to find pulsar candidates was to search plots close to our DEC and RA . We searched over three hundred plots to find promising candidates. We looked for sharp peaks in pulse profiles and horizontal spots on single pulse plots. If we found a great candidate we flagged them. After, we decided on which candidates to observe at the GBT.

This pulsar we found in the PSC Database(top). We decided to check it out using the GBT that night(7/29). what we found we found at the GBT is on the bottom. We concluded that this was a great pulsar candidate because of the distinct peaks and visible, vertical lines.

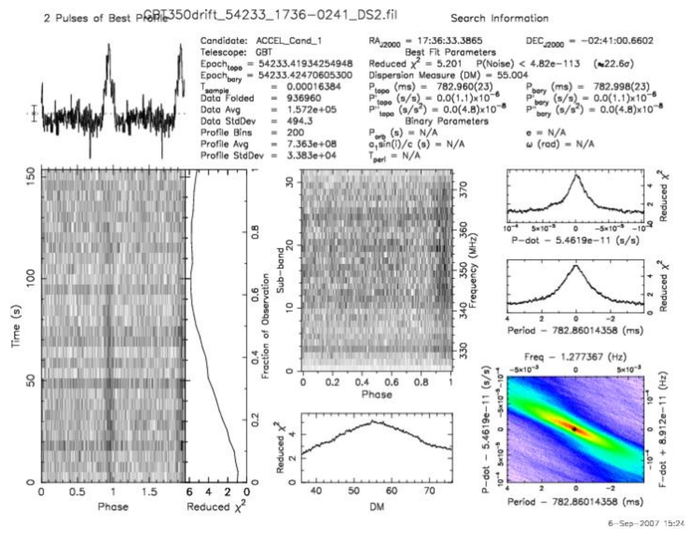

Figure 1. Shows the prepfold plot of the known pulsar, J1746-0241.

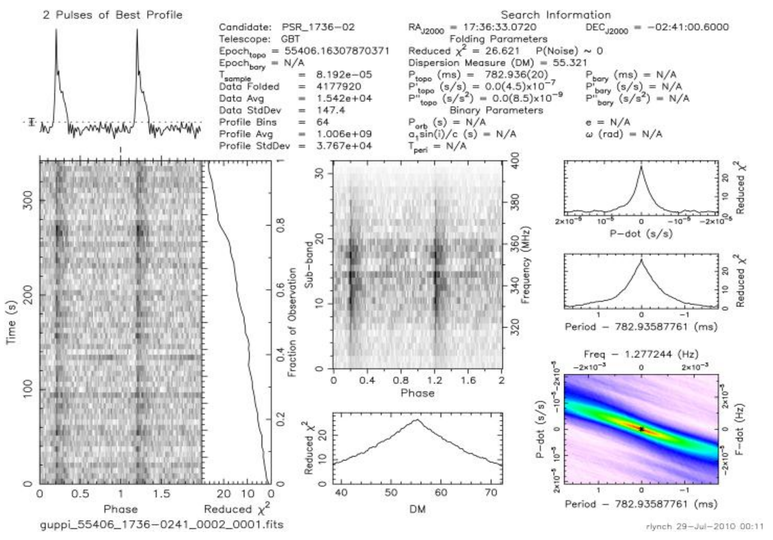

Figure 2. Shows the result of J1746-0241 after using the GBT.(7/29)

RA: 17:50
DEC: -13:42
DM maximum: 344

Single pulse plot

4.5 kpc=14625 light years away

Possibly a rotating transient-characterized by bright radio bursts, periodically related, but occur infrequently, unlike the pulses of a normal pulsar. Only appears at one time in the 140 second time period, but there is interference. The signal tapers at the ends and is thicker in the middle. This is why we chose it as our candidate.

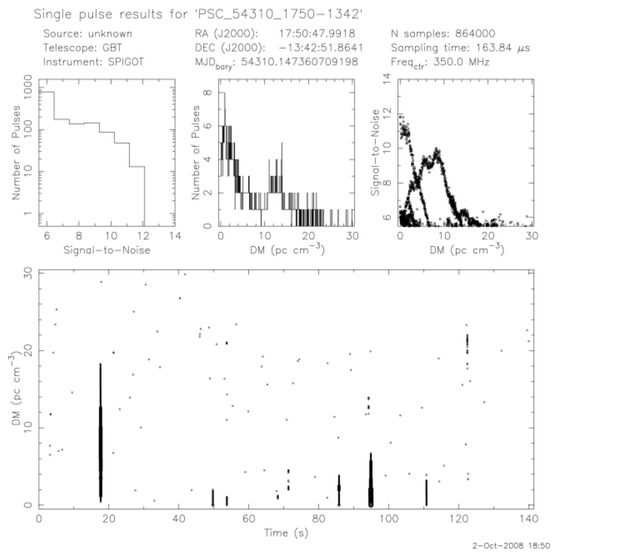

Figure 3. Shows the single pulse plot of the candidate 1750-1342.

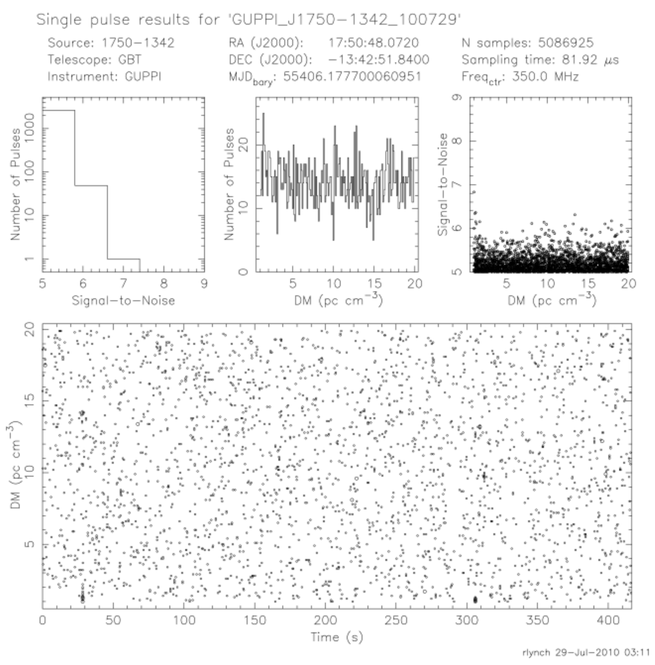

Figure 4. Shows the single pulse plot of the candidate 1750-1342 after using the GBT.(7/29)