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S2 MACHO Search G040411-00-Z

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This talk is available from the inspiral group notebook at:

- <http://www.lsc-group.phys.uwm.edu/cgi-bin/enote.pl?nb=s2macho&action=view&page=21>

Overview

- We are [Searching for a proposed population of binary primordial black hole binaries in the galactic halo.](#)
- [Observations of MACHO microlensing events suggest masses are between 0.15 and 0.9 M_{sun}.](#) It is not known what the size of the MACHOs are. One binary has been seen in 13-17 microlensing events towards the LMC.
- Theoretical calculations predict rates may be [as high as 0.1 per galaxy per year.](#) ($R = 0.05 * 2^{\pm 1}$)

Search Results

- Uses same pipeline and templates as the S2 BNS search (with thresholds tuned for MACHOs)
 - Assume a population of BBH MACHOs in the halo, [distributed as the halo dark matter](#)
 - Tune the pipeline and [perform Monte Carlo simulations to measure the efficiency](#)
 - Perform background slides using same method as BNS search
 - Choose clustering (4 seconds) and coherent statistic (same as BNS) [and look at zero lag triggers](#) to get upper limit
 - Currently looking at the three surviving triggers from pipeline and systematics on upper limit
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Goal is to produce a short paper for the LSC in November on S2 result.

S3 MACHOs

- Use pipeline that will be developed for S3 BNS on MACHOs
 - Include unused H1/H2 data from S2 in this pipeline
 - Result will be in S3 inspiral paper
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