Attachment DAT to the Memorandum of Understanding LIGO-M050267-00 between the Relativity and Astrophysics Group of Louisiana Tech University (RAGLT) and the Laser Interferometer Gravitational Wave Observatory (LIGO) For The Period August 15, 2008 - August 14, 2009

This Attachment DAT to the Memorandum of Understanding LIGO-M050267-00 defines the role of the Relativity and Astrophysics Group of Louisiana Tech University (RAGLT) as a Member of the LIGO Scientific Collaboration (LSC). In particular, it addresses data analysis activities in support of the initial LIGO interferometers. The period of performance for the activities in this Attachment is from August 15, 2008 - August 14, 2009.

1. Collaboration

Together, the LIGO Laboratory and the LIGO Scientific Collaboration (LSC) are responsible for implementing and exploiting the initial LIGO detector through its science data runs. The LSC has organized the data analysis effort into search groups which coordinate analysis, review, and publication on behalf of the collaboration. LSC groups are encouraged to participate in one or more of these groups.

MOU Attachment DAT defines the contributions of each participating group to the data analysis development groups.

2. Participation

During the period August 15, 2008 - August 14, 2009, the members of RAGLT will participate in the analysis of initial LIGO data in the following areas:

a. Binary Inspirals

* Automation of veto safety studies for S6. Safety studies have been carried out on S5 data using hardware injections and background rates provided by Gouaty (LSU). So far, the safety of using any pair of LSC channels has been checked, but the procedure used will allow for any combination of channels that has been observed in Detector Characterization studies to be checked. The existing codes will be adapted so that the channels to be used can be moved out to a configuration file. The perl and Matlab scripts will then be streamlined, and the resulting codes and configuration file will be called from a single shell script.
Application of safe vetoes Exploratory followup work has begun on S5 candidates that are left at the end of the inspiral search pipeline, and other combinations of channels that are found to be safe will be tested also as potential vetoes. If useful vetoes are found, the procedure will be automated to run from a single script. Since channels from known cause and effect chains will be used, safe vetoes with high use and efficiency can be incorporated into the current system of DQ flags, and lists of veto times produced.

b. Bursts
   Not Applicable

c. Stochastic
   Not Applicable

d. Continuous
   Not Applicable

e. Other Contributions
   Not Applicable

3. Resource Sharing

The LIGO Laboratory will contribute resources including allocation of appropriate scientific and engineering personnel, research facilities, and funding in support of the effort in Item No. 2, as indicated below.

a. Research accommodations for RAGLT group members while on LIGO research assignment at any LIGO Laboratory site.
   Not Applicable

b. Access to LIGO data through established LSC channels in support of this work.
   Not Applicable

4. Coordination and Reporting

RAGLT will perform research within the structures established by the LIGO Laboratory and the LSC where appropriate. In particular, with reference to activities described above:

2a will be carried out within the LSC Inspiral Search Group.

2b will be carried out within the LSC Burst Search Group.

2c will be carried out within the LSC Stochastic Search Group.

2d will be carried out within the LSC Continuous Waves search Group.
This includes keeping the Group leaders informed of activities and plans, reporting to the group at meetings and telecons, and through technical documents submitted to the LIGO Document Control Center.

In addition, an annual report will be submitted with the update to this Attachment, giving a summary status on research by topic as indicated in Item No. 2, including progress against the milestones if any, significant accomplishments such as new insights/discoveries or publications, issues of concern if any, and an indication of invested time.

This Attachment will be updated at least annually with a plan of activities for the succeeding one-year period. These documents will be due one month before the close of the period of performance under this Attachment.

5. Computer Code

All computer code delivered to the LSC under this Attachment must be developed in consultation with the LSC Data Analysis Software Working Group (DASWG) and archived, documented and reviewed as determined by that group.

Jay Marx  
LIGO Laboratory Director

Natalia Zotov  
Principal Investigator(s)

David Reitze  
LSC Spokesperson
Attachment OPS to the
Memorandum of Understanding LIGO-M050267-00
between the Relativity and Astrophysics Group of Louisiana Tech University (RAGLT)
and the
Laser Interferometer Gravitational Wave Observatory (LIGO)
For The Period
August 15, 2008 - August 14, 2009

This Attachment OPS to the Memorandum of Understanding LIGO-M050267-00 defines the role of the Relativity and Astrophysics Group of Louisiana Tech University (RAGLT) as a Member of the LIGO Scientific Collaboration (LSC) in the areas of detector commissioning, detector characterization, and operations support in the initial LIGO interferometers. The period of performance for the activities in this Attachment is from August 15, 2008 - August 14, 2009.

1. Collaboration

Together, the LIGO Laboratory and the LIGO Scientific Collaboration (LSC) are responsible for implementing and exploiting the initial LIGO detector through its science data runs. LSC groups are encouraged to contribute to the commissioning, characterization, and operation of the LIGO detectors, as members of working groups established by the LIGO Laboratory and the LSC.

2. Participation

During the period August 15, 2008 - August 14, 2009, the members of RAGLT will participate in the initial LIGO detector research program in the following areas:

a. Detector Commissioning
   
   Not Applicable

b. Detector Characterization
   
   * Zotov will continue to participate in the activities of the Glitch Group and will be joined by Reed. These activities include participating in offline shifts to note and characterize transients during the science runs.
   * Zotov will complete her commitment to studying four months of S5 e-log entries, and reporting times when DQ flags may be needed.
   * An undergraduate will be recruited to monitor glitches in the power system at Livingston, and check them against magnetometer channels and online BNS triggers for coincidence.
c. Detector Operations
   * Zotov and Reed will work science monitor shifts at Livingston during S6.

d. Other Contributions
   Not Applicable

3. Resource Sharing

The LIGO Laboratory will contribute resources including allocation of appropriate scientific and engineering personnel, research facilities, and funding in support of the effort in Item No. 2, as indicated below.

   a. Research accommodations for RAGLT group members while on LIGO research assignment at any LIGO Laboratory site.
      Not Applicable

   b. Access to LIGO data through established LSC channels in support of this work.
      Not Applicable

4. Coordination and Reporting

RAGLT will perform research within the structures established by the LIGO Laboratory and the LSC where appropriate.
In particular, with reference to activities described above:

   2a will be carried out in coordination with the LIGO Laboratory Commissioning Leader.

   2b will be carried out within the Detector Characterization Working Group of the LSC.

   2c will be carried out in coordination with the LHO or LLO Site Head.

This includes keeping the Group leaders informed of activities and plans, reporting to the group at meetings and telecons, and through technical documents submitted to the LIGO Document Control Center.
In addition, an annual report will be submitted with the update to this Attachment, giving a summary status on research by topic as indicated in Item No. 2, including progress against the milestones if any, significant accomplishments such as new insights/discoveries or publications, issues of concern if any, and an indication of invested time.
This Attachment will be updated at least annually with a plan of activities for the succeeding one-year period. These documents will be due one month before the close of the period of performance under this Attachment.

5. Computer Code
All computer code delivered to the LSC under this Attachment must be developed in consultation with the LSC Data Analysis Software Working Group (DASWG) and archived, documented and reviewed as determined by that group.

Jay Marx  
LIGO Laboratory Director

Natalia Zotov  
Principal Investigator(s)  
RAGLT

David Reitze  
LSC Spokesperson
Attachment OUT to the Memorandum of Understanding LIGO-M050267-00 between the Relativity and Astrophysics Group of Louisiana Tech University (RAGLT) and the Laser Interferometer Gravitational Wave Observatory (LIGO) For The Period August 15, 2008 - August 14, 2009

This Attachment OUT to the Memorandum of Understanding LIGO-M050267-00 defines the role of the Relativity and Astrophysics Group of Louisiana Tech University (RAGLT) as a Member of the LIGO Scientific Collaboration (LSC) in support of Education and Outreach to the broader community. The period of performance for the activities in this Attachment is from August 15, 2008 - August 14, 2009.

1. Education and Outreach

As a frontier physics effort, LIGO offers a unique opportunity to inspire interest in science among students and to educate the broader community. The LIGO Laboratory supports a broad program of education and outreach to take advantage of these opportunities. Activities to attract and educate visitors take place at both Observatories, as well as the development of educational materials for use there and elsewhere. The LIGO Laboratory is building a Science Education Center at the Livingston Observatory, and is participating with local partners to make it a vehicle for science education throughout the region. LSC groups are invited to participate in these activities, and to suggest others, with the goal of leveraging activities to make a greater impact.

This MOU Attachments defines the role and responsibilities of groups in this development group.

2. Participation

During the period August 15, 2008 - August 14, 2009, the members of RAGLT will participate in LDG in the following areas:

- a. Educational Materials Developed
  
  Not Applicable
- b. Other Contributions
  
  Outreach Activities
Zotov will continue to be involved in Ripple: Research and Inquiry-based Physics Project with LIGO and the Exploratorium, a successful project for training middle and high school teachers in interactive methods of teaching physics. Zotov will continue to be available to teachers, giving presentations and being available for discussions. She will also be available to take them on tours of the Livingston observatory.

3. Resource Sharing

The LIGO Laboratory will contribute resources including allocation of appropriate scientific and engineering personnel, research facilities, and funding in support of the effort in Item No. 2, as indicated below.

a. Research accommodations for RAGLT group members while on LIGO research assignment at any LIGO Laboratory site.

   Not Applicable

b. Access to LIGO data through established LSC channels in support of this work.

   Not Applicable

4. Coordination and Reporting

RAGLT will perform research within the structures established by the LIGO Laboratory and the LSC where appropriate. In particular, activities described in Item 2 will be carried out with the LIGO Observatories Educational and Outreach Leaders. This includes keeping the Group leaders informed of activities and plans, reporting to the group at meetings and telecons, and through technical documents submitted to the LIGO Document Control Center.

In addition, an annual report will be submitted with the update to this Attachment, giving a summary status on research by topic as indicated in Item No. 2, including progress against the milestones if any, significant accomplishments such as new insights/discoveries or publications, issues of concern if any, and an indication of invested time.

This Attachment will be updated at least annually with a plan of activities for the succeeding one-year period. These documents will be due one month before the close of the period of performance under this Attachment.

5. Computer Code

All computer code delivered to the LSC under this Attachment must be developed in consultation with the LSC Data Analysis Software Working Group (DASWG) and archived, documented and reviewed as determined by that group.
Jay Marx  
LIGO Laboratory Director

Natalia Zotov  
Principal Investigator(s)  
RAGLT

David Reitze  
LSC Spokesperson
Attachment Z to the Memorandum of Understanding LIGO-M050267-00 between the Relativity and Astrophysics Group of Louisiana Tech University (RAGLT) and the Laser Interferometer Gravitational Wave Observatory (LIGO) For The Period August 15, 2008 - August 14, 2009

This Attachment Z to the Memorandum of Understanding LIGO-M050267-00 lists the members of Relativity and Astrophysics Group of Louisiana Tech University (RAGLT) participating in LIGO Scientific Collaboration (LSC) development group activities in support of the initial LIGO interferometers. The period of performance for these activities is from August 15, 2008 - August 14, 2009.

Faculty: 

The Faculty category includes all “faculty rank” LSC members. This includes professorial appointments, research faculty appointments, teaching faculty appointments, lecturer and reader appointments, and visiting appointments in all these categories.

Name: Zotov, Natalia  
Postal Address: Louisiana Tech University  
Phone: 1 318 257 3171  
Fax: 1 318 257 2182  
Email: @LIGO.Org: natalia.zotov@LIGO.Org  
Forwarding: zotov@latech.edu  
City: Ruston  
State: LA  
Postal Code: 71272  
Country: USA

Technical Staff: 

The Technical Staff category includes all non-PI LSC members with scientist, engineer, computer systems administrator or programmer, technician, and similar appointments, and visiting appointments in all these categories.

Postdoctoral Scholars: 

Graduate Students:

Name: Reed, Tracie
Postal Address: P. O. Box 10348
City: Ruston
State: LA
Postal Code: 71272
Country: USA
Voice: 1 318 274 2423
Fax: 1 318 274 6388
Email: tracie.reed@LIGO.Org
Forwarding: tmr016@latech.edu

Undergraduate Students:

Name: Gragston, Mark
Postal Address: P.O. Box 4857
City: Ruston
State: LA
Postal Code: 71272
Country: USA
Voice: 318 257 2427
Fax: 218 257 2182
Email: mark.gragston@LIGO.Org
Forwarding: mtg011@latech.edu

Administrative Staff:

The Administrative Staff category allows the listing of administrative aides and other staff members who perform essential support services in or for LSC member groups, but are not involved in the LIGO Scientific Collaborations engineering or scientific work. Personnel who are involved in the LSC’s scientific or engineering work, including computer system administration and programming, should be listed under other categories. Personnel listed as Administrative Staff may be designated as a point of contact or proxy, but do not appear as authors on LSC publications, do not count toward a group’s council delegate allocation, may not serve as council delegates, and do not increase a group’s shift obligation.

FTE Commitment:

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Category</th>
<th>Member</th>
<th>Research</th>
<th>LIGO</th>
</tr>
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<tr>
<td>1</td>
<td>Gragston, Mark</td>
<td>undergraduate</td>
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<td>20%</td>
<td>100%</td>
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<tr>
<td>2</td>
<td>Reed, Tracie</td>
<td>graduate</td>
<td>100%</td>
<td>50%</td>
<td>100%</td>
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<tr>
<td>3</td>
<td>Zotov, Natalia</td>
<td>faculty</td>
<td>100%</td>
<td>50%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Total FTE: 3.00
Roles:
Principal Investigators: Zotov, Natalia
Membership Point-Of-Contact: Zotov, Natalia
Group PIO/Press Coordinator: Zotov, Natalia
Proxies:
Author Eligible Council Delegates
Zotov, Natalia Zotov, Natalia
Reed, Tracie

Approvals:

Jay Marx
LIGO Laboratory Director

Natalia Zotov
Principal Investigator(s)
RAGLT

David Reitze
LSC Spokesperson