

**Attachment DAT to the
Memorandum of Understanding (LIGO-M060057-00-M)
between the
Embry-Riddle Gravitational Wave Astrophysics Group (ERGWAG)
and the
Laser Interferometer Gravitational Wave Observatory (LIGO)
August 15, 2005**

This Attachment DAT to the Memorandum of Understanding LIGO-M060057-00-M defines the role of the Embry-Riddle Gravitational Wave Astrophysics Group (ERGWAG) as a Member of the LIGO Scientific Collaboration (LSC), in particular, its activities in data analysis in support of the initial LIGO interferometers. The period of performance for the activities in this Attachment is from August 15, 2005 to August 15, 2006.

1. Together, the LIGO Laboratory and the LIGO Scientific Collaboration 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 the analyses, perform detailed reviews, and prepare publications on behalf of the collaboration. LSC groups are encouraged to participate in one or more of these groups. MOU Attachments define the contributions of each participating group to the data analysis groups.
2. During the period August 15, 2005 to August 15, 2006, the members of ERGWAG Group will participate in the analysis of initial LIGO data in the following areas:
 - a) *Bursts* -- The characterization of transients in Initial LIGO data is a large topic that will require the efforts of numerous groups. ERGWAG will contribute by tracking, categorizing and attempting to understand the propagation properties within the instruments of burst-like transients identified by the various on-line search algorithms. For large transients, such as those in the list of loudest events recorded by WaveBurst or Kleine-Welle, this analysis can proceed by applying simple digital filters to the auxiliary channels and then scanning the data by eye. For smaller transients, we intend to use statistical methods to track the propagation of transients to the auxiliary ports. Using what we learn from tracking the largest transients (propagation time to various ports and the effect on the waveform) we can design and apply triggered, matched, time domain filters to search for frequent low amplitude transients which only become evident in an statistically significant excess of triggers for particular combinations of filters and channels. Potential information gained could be used to hunt down and remove the source of a particular glitch population, to refine the shape of whitening filters at the various ports with an eye to improved transient detection, and finally to develop more efficient gravitational wave vetoes and data quality flags.
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 ERGWAG group members while on LIGO research assignment at any LIGO Laboratory site,
 - b) Access to LIGO data in support through established LSC channels in support of this work.
4. Coordination and Reporting – ERGWAG Group will perform this research within the structures established by the LIGO Laboratory and the LSC where appropriate. In particular activities described in Item 2a) will be carried out within the LSC Burst Search Group. Coordination will include 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 on-year period. These documents will be due one month before the close of the period of performance under this Attachment.

5. 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.
6. The research effort pursuant to this Attachment will be coordinated by Andri M. Gretarsson (ERGWAG Group), Albert Lazzarini (LIGO Laboratory) and Peter Shawhan (LSC Burst Search Group Leader).

Approved:



Jay Marx
LIGO Laboratory Director

Andri M. Gretarsson
ERGWAG Principal Investigator



Peter Saulson
LSC Spokesperson

YYYYY
LSC Burst Search Group Leader

Albert Lazzarini
LIGO Laboratory Data and Computing
Group Leader