LIS INITIAL DATA RELEASE

Release Notes

Scope of this release

This initial quality-assured release of the first months (Dec 97-Feb 98) of TRMM LIS data is being provided to interested users and to the LIS Science Team. It is not the final data release. Certain aspects of the distributed data have not yet been fully optimized and a few minor glitches are still contained in the distributed HDF files. These limitations are described below. Users should also carefully read the tips in secion 2.3, "Data Usage", of the software manual.

The LIS/OTD IDL and C software developed by the LIS science team is being offered as a courtesy to the science community. It should be considered beta software, and the initial release community should consider themselves beta testers. As such, all bug reports and/or feature requests should be thorough and complete, with as much supporting information provided as possible. Vague bug reports cannot be effectively handled. A sample bug report is included at the end of this document.

The next planned data reprocessing is scheduled for August 1998, coincident with other TRMM data. Monthly data releases will subsequently continue to catch up to the current calendar month.

User Mailing Lists and LIS/SCF Interaction

The Global Hydrology Resource Center (GHRC) User Services branch should be your official contact point for all aspects of this data and user software:

Email: ghrc@eos.nasa.gov
WWW: http://wwwghrc.msfc.nasa.gov

An informal set of mailing lists is also maintained to support the user community. The lists are `lisotd-announce`, `lisotd-science` and `lisotd-software`. To subscribe, send email to:

`majordomo@qburst.msfc.nasa.gov`

with the words:

`SUBSCRIBE lisotd-(annouce,science or software)`

in the message body. You will receive a welcome email describing the list rules and functions, as well as instructions on how to unsubscribe.

We will monitor these mailing lists as frequently as possible. They are primarily to facilitate discussion and rapid dissemination of information within the LIS user community. Again, all formal data requests and bug reports should always be made through the GHRC.

Known temporary problems in the HDF files:

These are the known structural problems within the LIS HDF data files. The known errors are all relatively minor and should not significantly impact usage of the prerelease data.

- ***Issue*:** Orbit numbers occasionally are misreported within the orbit_summary variable, and do not correspond with the HDF file name. ***Workaround***: The file names are always definitive and correct.

- ***Issue:*** The number of viewtimes retrieved from the HDF file is sometimes different than the number listed in the point_summary.vt_count variable. ***Workaround:*** When read by LISAPP or the high-level C and IDL APIs provided in this release, no viewtime granules have ever been lost when this occurs; rather, some "false" zero-filled granules are present in the retrieved data. Users of these tools should always check for zero-filled viewtimes in the retrieved data. Users of the low-level C API should always use the HDF-level vdata count routines to retrieve the correct number of viewtimes.

- ***Issue:*** None of the manual quality assurance flags have been set in this data release. ***Workaround:*** The automatic quality assurance flags can still provide most of the information you will need to retain high-quality data. Manual Q/A flags will be set in the next data release.

- ***Issue:*** Text (ASCII) metadata is not currently inserted in the HDF files. ***Workaround:*** We are reconsidering the inclusion of ECS-flavor metadata given the limited availability of ECS support. Such metadata is primarily used for automated data ordering and database management. Since the LIS data will initially be maintained at the LIS/SCF and ordered through the GHRC, we maintain our own database archival and retrieval system which does not rely on metadata included in HDF file granules. ECS-flavor metadata is of limited direct use to end-users and we have guaranteed that all pertinent information is contained within the data/software documentation supplied with all LIS data.

Known and permanent limitations in the data:

These are characteristics of December-February data release which can not be addressed and should be considered.

- ***Issue:*** The threshold curve (threshold value applied given a certain background radiance) varied during the first several weeks of the mission. ***Workaround:*** This is an intentional calibration procedure to maximize sensitivity and minimize false (noise) events. Always consider threshold values in your analyses.

- ***Issue:*** No data is available during certain CERES rotation maneuvers (7 January). ***Workaround:*** This is an unavoidable result of the CERES calibration maneuver. Be sure to avoid maneuver periods if you batch process, and always consult the alert flags.

- ***Issue:*** Very high thresholds are applied to portions of some very bright scenes. ***Workaround:*** This occurred more frequently early in the mission, and primarily during periods of low solar beta angle (sun directly overhead). Always consider the reported thresholds in your analyses.

- ***Issue***: The sensor seems to go "blind" briefly during high flash rate storms. ***Workaround:*** This occurs when the onboard LIS software buffers fill up with lightning or noise data. The buffers take about 10-12 seconds to empty, during which time the sensor is "blind". This is documented in the software manual. Users should always employ the viewtime and alert flag data elements (which flag this blinding).

- ***Issue:*** Data quality and viewtime is reduced in the South Atlantic portions of the LIS and OTD orbits. ***Workaround:*** This is an inevitable consequence of the *South Atlantic Anomaly*, a high-noise region in the Earth's space environment. We try to filter noise in this region as much as possible. Users may wish to utilize the quality parameters associated with each datum to further scrutinize data reported in this region. Note the SAA radiation affecting LIS covers half the area of that seen by OTD.

- ***Issue:*** Orbits during the initial post-launch period (Dec 1-8) contain some "repaired" ephemerises; these are not fully indicated in the attitude/ephemeris QA flags. ***Workaround:*** This repair was due to repeated flight maneuvers in this window to boost TRMM to its final orbit. Attitude/ephemeris outside of maneuvers during this window should still be of very high quality. Nav data during maneuvers should be used cautiously. Note that until TRMM reached its final orbit, the use of slightly inaccurate orbital altitudes will result in very minor geolocation errors near the corners of the pixel array. Use all geolocations during the Dec 1-8 window with caution.

- ***Issue:*** Some valid HDF files contain no lightning point data. ***Workaround:*** This occurs during rare instances when the orbit is primarily over convection-free oceanic regions. All other HDF data are still correct in these orbits. Most of the LIS software handles these instances seamlessly; however, users of the low-level C API should use some caution and trap for such cases. In all cases the lowest-level (HDF) vdata access routines will inform users if no point data is available. Users of higher-level APIs should always check for zero data counts in the `orbit.point_summary` variable.

Known temporary limitations in the data:

These are issues which are known to be suboptimal in the first release data set and which we are continuing to address at the LIS/SCF. If possible, these issues will be resolved by the subsequent reprocessings of the entire data set.

- ***Issue:*** The calibrations used to convert raw sensor counts to radiance have not yet been fully verified. Reported radiances will be internally consistent but may be biased. ***Workaround:*** Avoid using the absolute magnitude of radiances for scientific use until the next release. Relative radiance statistics should still be valid.

- ***Issue:*** Noise filters have not been optimized. While the level of false events in the files should be low, the amount of good data which has been rejected has not been fully identified and will likely decrease with each subsequent release. ***Workaround:*** Do not consider the first release data set to be indicative of LIS' actual detection efficiency.

- ***Issue:*** Flash grouping has not been optimized. Due to the large number of events seen in each flash (a result of LIS' improved sensitivity and resolution), nominal LIS flashes may not faithfully correspond to actual flashes as defined by connected channels. Multiple short flashes may get combined together in our data, while very long duration and large spatial extent flashes may be broken up. ***Workaround:*** This limitation is present in *any* remotely sensed lightning data, RF or optical. Consider using our lightning "group" product, which is algorithmically robust. LIS groups are more analogous to strokes or K-changes than lightning flashes. Consider writing your own grouping algorithm using the LIS group and/or event data. Or simply be aware that LIS flash counts have some built-in limitations, which we will attempt to minimize with the next data release.

Known issues with the LIS/OTD user software:

These are issues known to affect the beta release of the LIS/OTD analysis software. Please consult these before reporting software bugs to the GHRC.

- ***Symptom:*** File import in IDL is somewhat slow. ***Workaround:*** If working under IRIX or MacOS, use the shared library LISOTD_*.so (see the Software User's Guide for details). If working on other platforms, consider compiling the shared library for your platform. This will likely require the assistance of your sysadmin; support cannot be provided by the LIS/SCF. As a courtesy to your colleagues, please let us know if you manage to recompile the shared library. The lisotd-software mailing list would be an ideal vehicle for such information.

- ***Symptom:*** LISAPP fails to launch after I compile it. ***Workaround:*** The most common cause of this problem is a bad preferences file trying to find nonexistent default directories. Change directories to your LISOTD/IDL directory, start IDL, type ".compile lisapp" then "create_prefs". This will re-initialize your default paths to the current working directory. You only need to type "create_prefs" *once* to fix this - typing it at the start of every session will erase any preferences you do want saved.

- ***Symptom:*** LISAPP colors don't seem to be right. ***Workaround:*** IDL handles colors on different platforms in a multitude of ways. If less than 220 colors are available in your IDL palette (print,!d.n_colors), some LISAPP modules will render incorrectly, others may fail entirely. Try exiting IDL, restarting it, typing ".compile lisapp", followed by "device, pseudo=8", then "lisapp". If this works, you will need to invoke the device command at the start of each session. There is no simple way to avoid this and maintain full cross-platform compatiblity in the application.

- ***Symptom:*** In the "Choose Bounds" LISAPP window, some point data is not retained between zoom-ins and zoom-outs. ***Workaround:*** This is a known bug. All point data may be recovered by zooming out as many times as possible.

- ***Symptom:*** In the "Flash Analysis" LISAPP window, if the flashes are subsetted beyond the initial list, the "live time update" label does not accurately reflect the time series plot window. ***Workaround:*** This is a known bug. Disregard the live update label if you have further subsetted the flashes.

- ***Symptom:*** Some LISAPP analysis and export modules take forever to run. ***Workaround:*** Not all modules are meant to be used over large spatial regions. Use the "Choose bounds" window as much as possible to narrow down your region of interest.

- ***Sympotom:*** Some background plots look too "blobby"; some labels are hard to read. ***Workaround****:* This is a result of the fact that IDL does not ship with fonts, but rather relies on installed system fonts for many plot symbols and labels. These fonts vary in rendered size across platforms. The final software release will add font sizing to the LISAPP preferences. For now, please inform us of the specific plot (and platform you are working on) and we will attempt to provide a patch.

- ***Symptom:*** LISAPP crashes and I can't get at the command line. ***Workaround:*** This most often happens under Windows systems if you have minimized the command line window, and modal IDL windows take full command of the user interface. In this situation, you must force-quit IDL and restart it. On other platforms, try typing "widget_control,/reset"; the default keyboard focus may still be the IDL command line, even if it is not visible. Refer to the documentation on how to properly recover from crashes.

- ***Symptom:*** Some labels and buttons in LISAPP seem scrunched or incomplete. ***Workaround:*** This again is a variable font size issue; see above for details.

- ***Symptom:*** The Makefile doesn't work for my C programs. ***Workaround:*** Be sure you have installed the full HDF4.1r1 or higher distribution on your system (libraries and includes). Be sure your Makefile has been modified to reflect the accurate location of these libraries on your system. Try enlisting the aid of your sysadmin who may more easily spot bad Makefile settings. Please consult the documentation for a list of platforms which are supported by the LIS/SCF for this software.

Sample Bug Report

This is an example of the *minimum* information we will need to properly handle a data or software bug report. All bugs should be reported directly to GHRC User Services (`ghrc@eos.nasa.gov`) with a descriptive line in the email's subject header. We cannot guarantee that incomplete bug reports will be handled; please include all information requested below.

Please refer to the list of supported and unsupported platforms in the Software Users Guide. We cannot guarantee assistance on unsupported platforms.

User Name:
Institution:
Computer Platform:
Operating System and Version:
HDF Version Installed:
HDF Include Files Installed? (yes/no)**:**

User Software Version (currently 1.0b1)**:**
Software (LISAPP, IDL API, C High Lev API, C Low Lev API)**:**
Using Shared Library? (LISAPP and IDL API only) (yes/no):

Data release version (from HDF file names, currently 4.0):
Data file in which problem is observed (if relevant):

If the problem is a compilation error in C or IDL, please attach the Makefile you are using and/or a copy of your custom code.

Complete description of problem: