

Advanced LIGO Engineering Change Request (ECR)

ECR Title: Beamsplitter Suspension Wire Shielding Baffle

DCC No: E1400305-v1

Date: 20 Jun 2014

(note: decision to proceed made 3/2014)

Requester: Calum Torrie

Impacted Subsystem(s): SUS

Description of Proposed Change(s): The addition of baffle to shield the Beamsplitter suspension wire from heating from reflected and scattered main interferometer light (see [D1400094](#))

Reason for Change(s):

Recent L1 testing has revealed that the BS optic pitch drifts during PRMI carrier lock:

<https://alog.ligo-la.caltech.edu/aLOG/index.php?callRep=9300>

<https://alog.ligo-la.caltech.edu/aLOG/index.php?callRep=9394>

https://services.ligo-wa.caltech.edu/integrationissues/show_bug.cgi?id=505

Differential wire heating (front versus back wires, on one or both sides) from the carrier beam is suspected. A ray trace analysis ([T1400153](#)) demonstrates that there are reflected and scattered light paths that can lead to heating the BS suspension wires.

Estimated Cost: \$12K hardware costs, plus ~40 hrs design/fab time, plus ~60 hrs clean, bake and install time. Total = ~\$17K

Schedule Impact Estimate: None. This BS wire shield will be added only when a convenient opportunity arises. However the plan is to have this shield available for the upcoming Jun/Jul 2014 vent of the H1 interferometer.

Nature of Change (check all that apply):

- Safety
- Correct Hardware
- Correct Documentation

- Improve Hardware
- Improve/Clarify Documentation
- Change Interface
- Change Requirement

Importance:

- Desirable for ease of use, maintenance, safety
- Desirable for improved performance, reliability
- Essential for performance, reliability
- Essential for function
- Essential for safety

Urgency:

- No urgency
- Desirable by date/event: Jun/Jul 2014 H1 vent
- Essential by date/event: _____
- Immediately (ASAP)

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Impacted Hardware (select all that apply):

- Repair/Modify. List part & SNs: _____
- Scrap & Replace. List part & SNs: _____
- Installed units? List IFO, part & SNs: _____
- Future units to be built

Impacted Documentation (list all dwgs, design reports, test reports, specifications, etc.):

New drawings listed in DCN E1400213

Disposition of the proposed change(s):

The disposition of this proposed engineering change request is to be completed by Systems Engineering and indicated in the “Notes and Changes” metadata field in the DCC entry for this ECR. The typical dispositions are as follows:

- **Additional Information Required**: in which case the additional information requested is defined. The ECR requester then re-submits the ECR with the new information using the same DCC number for the ECR but with the next version number.
- **Rejected**: in which case the reason(s) for the rejection are to be given
- **Approved**
- **Approved with Caveat(s)**: in which case the caveat(s) are listed
- **TRB**: the ECR is referred to an ad-hoc Technical Review Board for further evaluation and recommendation. It is the System Engineer’s (or designee’s) responsibility to organize the TRB. The System Engineer (or designee) then makes a technical decision based on the TRB’s recommendation. Links to the TRB’s documentation (charge, memos, final report, etc.) are to be added to the “Related Documents” field for this ECR.
- **CCB**: a change request for approval of additional funds or schedule impact is to be submitted to the Configuration Control Board. Links to the CCB’s documentation (CR, etc.) are to be added to the “Related Documents” field for this ECR.

Concurrence by Project Management:

Acknowledgement/acceptance/approval of the disposition is to be indicated by the electronic “signature” feature in the DCC entry for this ECR, by one the following personnel:

- Systems Scientist
- Systems Engineer
- Deputy Systems Engineer