

Wieman, Seth

From: Wieman, Seth
Sent: Tuesday, May 31, 2016 12:29 PM
To: 'cac@bostonmicromachines.com'
Cc: Mawet, Dimitri; 'james.k.wallace@jpl.nasa.gov'; 'gruane@astro.caltech.edu'; Fucik, Jason
Subject: Kilo-DM custom mount
Attachments: Kilo-DM alternative mounting.pdf

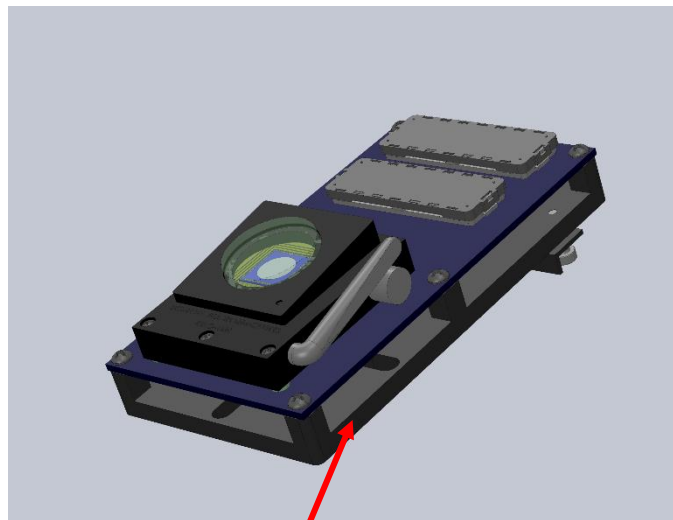
Hi Charles and Mike,

Many thanks again for your input on our planned Kilo-DM mounting. Attached are a few slides showing the concept I described over the phone. (Some others from the Caltech/JPL team working on this project are cc'd on this message).

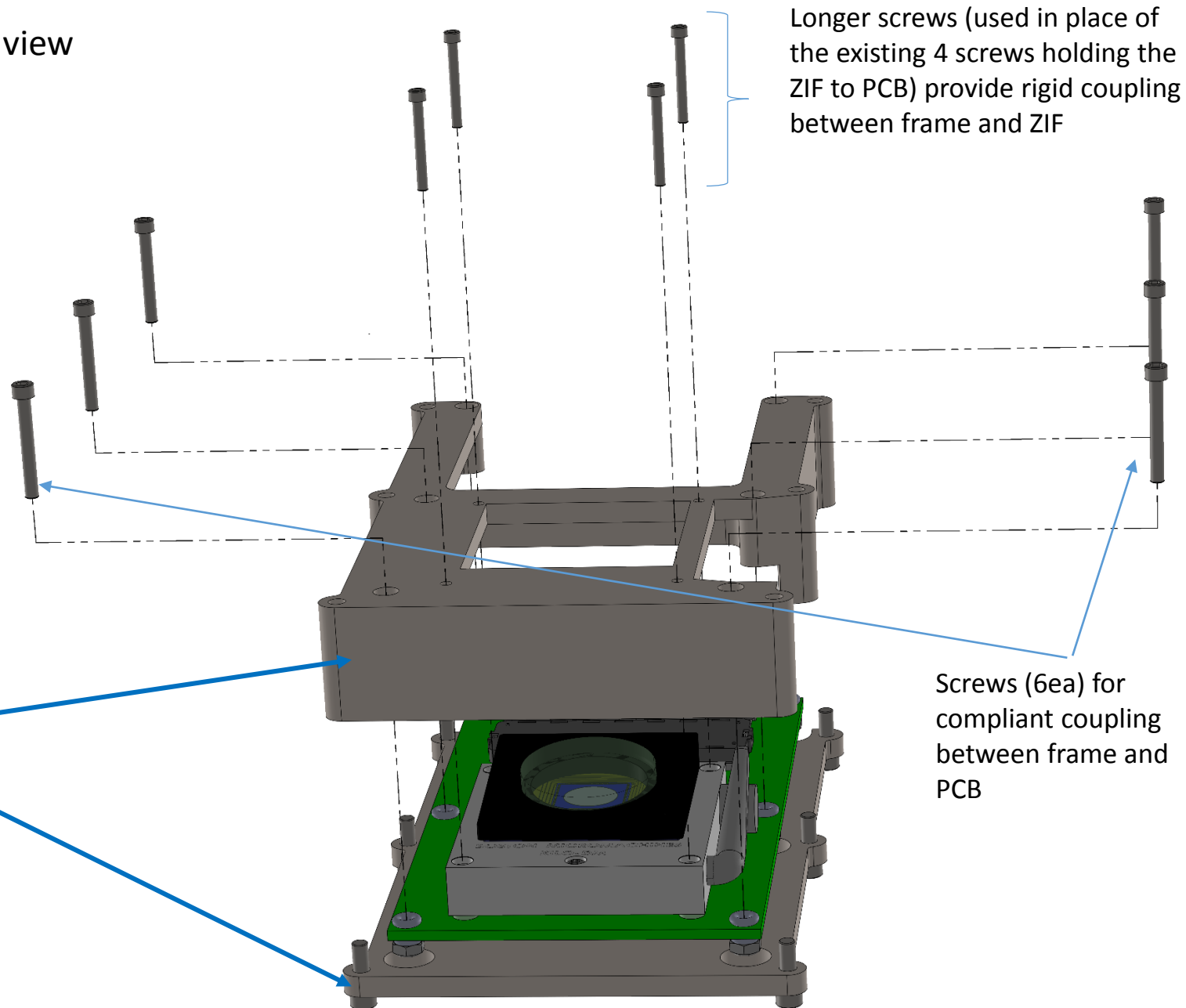
Please let us know if the attached mounting approach looks sound. Any suggestions or concerns you have are most welcome.

Best regards,
Seth

Alternative Mounting for Kilo-DM - exploded view



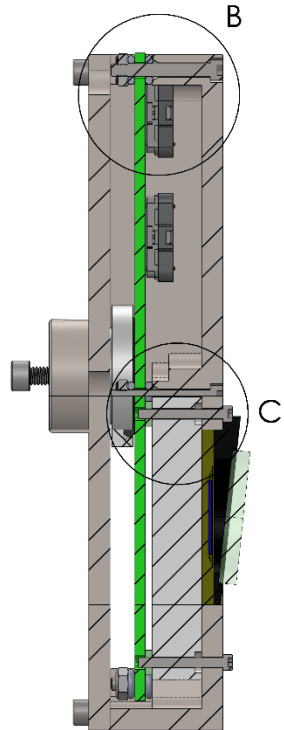
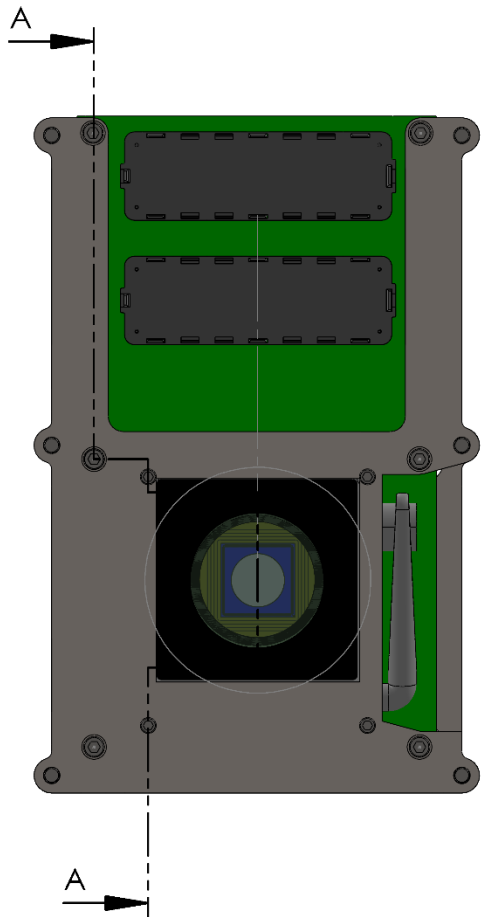
Replace the **Al** frame which mounts only to PCB with a **SS** frame which mounts rigidly to DM ZIF socket and compliantly supports PCB and cabling



Longer screws (used in place of the existing 4 screws holding the ZIF to PCB) provide rigid coupling between frame and ZIF

Screws (6ea) for compliant coupling between frame and PCB

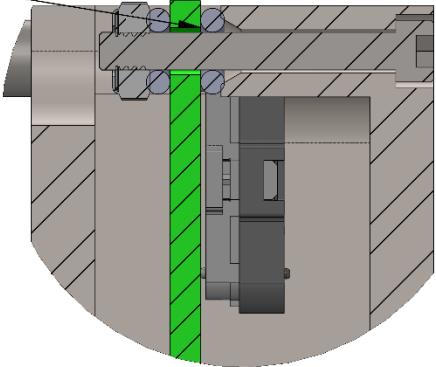
Alternative Mounting for Kilo-DM - cross-sectional view1



SECTION A-A

RIGID INTERFACE BETWEEN
SS FRAME AND DM ZIF SOCKET

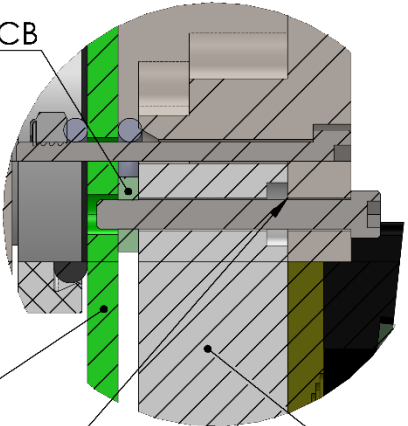
COMPLIANT CONNECTION
TO DM PCB



DETAIL B
SCALE 2 : 1

EXISTING
THREADED
INSERT IN PCB

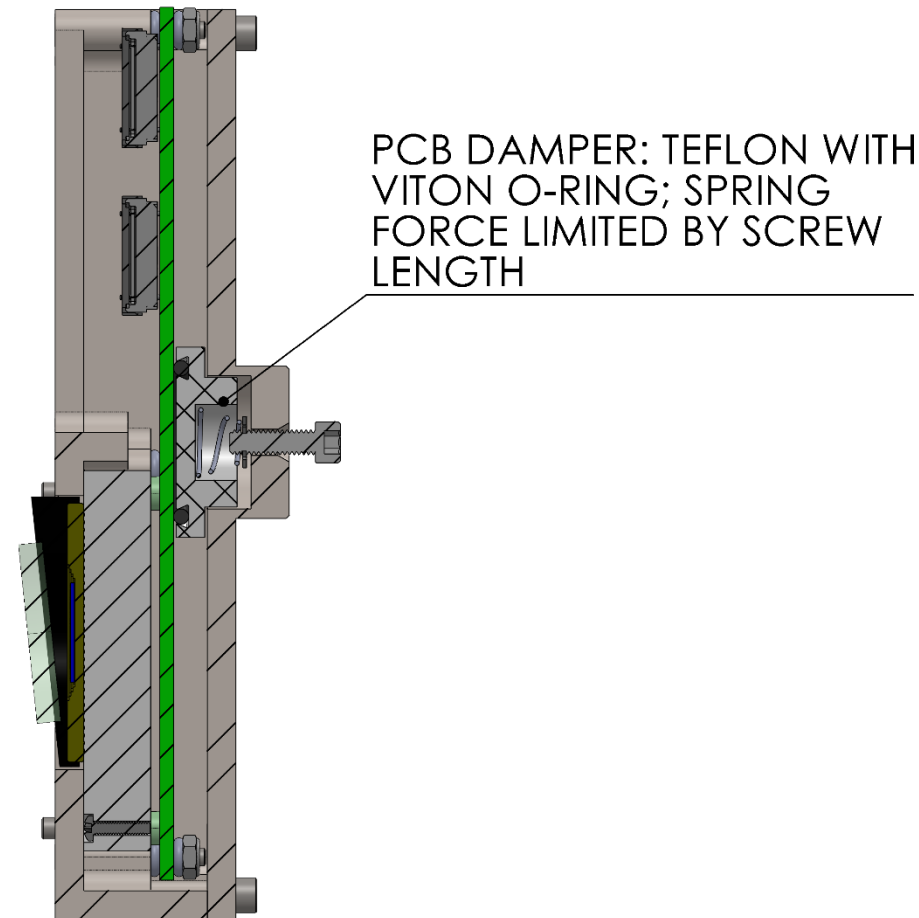
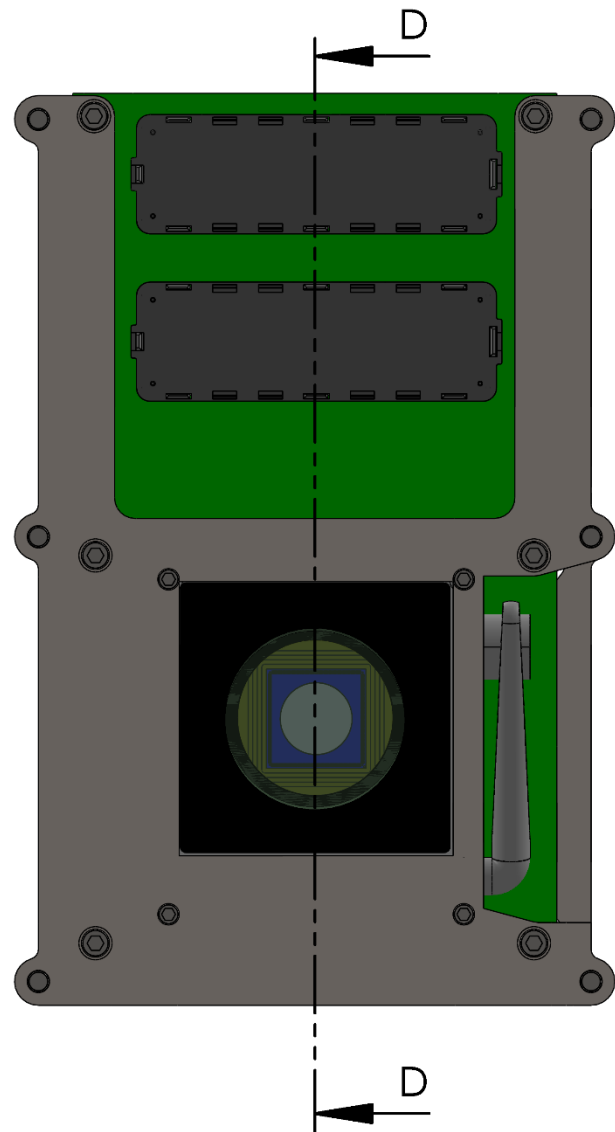
PCB



DETAIL C
SCALE 2 : 1

ZIF

Alternative Mounting for Kilo-DM - cross-sectional view2



SECTION D-D
SCALE 2 : 3

EMAIL chain that began after sending the above design (bottom to top chronologically):

Dear Michael,

Many thanks for sharing your perspective on this. We have not abandoned the idea of modifying the mount but certainly don't want to risk damaging it or using it in a way that will lower its performance. In this regard we appreciate the advice your team has provided and your offer of guidance as we proceed. I'll be in touch as our plan develops.

Best wishes,
Seth

From: Michael Feinberg <mrf@bostonmicromachines.com>

Sent: Friday, June 17, 2016 12:40:17 PM

To: Wieman, Seth

Cc: Tracy Raymond; Charles, Conway

Subject: RE: Kilo-DM Mount Alterations

Dear Seth,

From the tone of your response I wanted to chime in on the situation:

Modifications to our mounts have been carried out before for other astronomical applications without issue (Gemini Planet Imager being one), however none mentioned vibration issues as their major motivation. Charles has explained that the warranty for the mount will be voided if you decide to make the modification that you proposed. This was not meant to deter you from this decision but to simply state that you should be extra careful.

I just wanted to make sure that you were aware that this is not the first time this has been successfully carried out and that we would be happy to offer guidance along the way as questions come up.

Thanks for keeping us apprised of the situation and we look forward to hearing from you again in the future.

-Michael

Michael Feinberg
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mrf@bostonmicromachines.com

From: Wieman, Seth [<mailto:swieman@caltech.edu>]

Sent: Friday, June 17, 2016 11:40 AM

To: Charles, Conway <cac@bostonmicromachines.com>

Cc: Michael Feinberg <mrf@bostonmicromachines.com>; Tracy Raymond <tracy@bostonmicromachines.com>

Subject: RE: Kilo-DM Mount Alterations

Dear Charles,

Many thanks for your message and comments on our planned Kilo-DM mount. We appreciate the time you have spent reviewing our design – the concerns you have expressed will be a strong factor in our decision over how to move forward. I will likely have a few further questions after discussing with the team here our options for ensuring the stability of the mirror.

Best regards,
Seth

From: Charles, Conway [<mailto:cac@bostonmicromachines.com>]
Sent: Friday, June 17, 2016 6:31 AM
To: Wieman, Seth <swieman@caltech.edu>
Cc: Michael Feinberg <mrf@bostonmicromachines.com>; Tracy Raymond <tracy@bostonmicromachines.com>
Subject: Kilo-DM Mount Alterations

Dear Seth,

Thank you for sending this. We appreciate you reaching out to us before moving ahead.

Before getting into the specifics, I need to caution you that, after thorough discussion involving engineering and management, we want to register our concern about the basic idea of any modification to the mount. We don't have an objection to your design in particular (except for some comments I will describe below), but we cannot endorse or guarantee any mount except the mount that we have designed, tested, manufactured and installed ourselves. Because we are not in a position to fully analyze or test your proposed mount, we want to be clear that we cannot make any assurances or assessments about whether it will work as desired to reduce vibration, or whether there might be any unplanned negative effects on the mirror or its functionality. Therefore, we need you to understand that any physical or structural modifications to the system including those specified in your proposed design will void the warranty.

Before trying this we want to encourage you to consider whether there are any other steps you can take that would not jeopardize the mirror, such as using a heavier and more stable optical table and considering other environmental factors.

If you decide to accept that risk and move forward on the design, we can offer you these suggestions and comments:

- In general, you will want to be very careful when tightening screws to make sure that you do not overtighten them and damage any of the components, e.g., the ZIF socket, PCB board, or the DM.
- On slide 2, detail C you call out the wrong threads "Existing Threaded insert in the PCB." What you are calling out is a green spacer that we use for assembly of the ZIF socket to the PCB. The threads are in the base of the ZIF socket.
- The threads inside the ZIF socket are plastic, which may not be the best for vibration control.
- You will not want to have the DM attached while modifying the MMB assembly.
- Removing the screws of the ZIF socket can cause the top plate of the ZIF socket to shift and possibly come off. It can be very difficult to re-attach the top plate and there is an increased risk of damaging the ZIF socket when re-attaching the top plate.

- When removing the screws you should have the ZIF socket handle in the open position to help reduce the risk of damaging the ZIF socket.

Please let me know if you have any further questions on this.

Sincerely,

Charles Conway

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