

A+ BBS Flatness Requirements - Yamamoto ☆ 📁 ☁

File Edit View Insert Format Tools Extensions Help

🕒 🗨️ 🔒 Share ▼ 🐼

🔍 Menus
↶ ↷ 🖨️ ↺ 🔍
100%
Normal text
Arial
13
B I U A
🔗 📎 🖼️
📄 📑 📔 📕 📖 📗 📘
Editing
31

BS Flatness Email from Hiro Yamamoto regarding the A+ BBS requirements added to LIGO-T1900187

I got this back from Hiro. So, maybe RoC > 500 km for the concave case?

And we should stick this email in the DCC somewhere.

Peter

Begin forwarded message:

**From:** "Yamamoto, Hiroaki" <hiroy@caltech.edu>  
**Subject:** Re: BS flatness  
**Date:** March 16, 2020 at 5:13:49 PM EDT  
**To:** Peter Fritschel <pf@ligo.mit.edu>

Peter

This is my quick/dirty analysis.

I used L1 and H1 case with BS HR side has extra power term.

First one is the xsec of BS, and the second one is the relative change of the PRG and signal gain (change of the TEM00 mode power at the dark port for a change of the arm length  $dE00 / d(\text{arm length})$ ).

The third plot is the all maps of BSs, just to show how dirty they are.

From the second plot, especially H1 (red), if we want to keep the effect of the BS curvature less than 10%, I say that the requirement is  $\Delta \text{RoC} > 500\text{km}$ , or within  $\text{invRoC} < 0.2\text{e-5}$ .

BS is pretty dirty and I want to revisit and fix some part of the code. But, this will give some idea what kind of tolerance is needed.

On Mar 12, 2020, at 2:32 PM, Peter Fritschel <pf@ligo.mit.edu> wrote:

What comes to mind are: