



COC QA TEST REPORT

ITM01 HR Integrated Scatter

Test Date	May 19-22, 2017		
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Approval(s)			
Specification Doc.	LIGO-E0900041	Specification	Not specified in E0900041
Procedure Doc.	LIGO-E1000863		
1 st Scan (Mean ± Error*)	6.5 ± 2 ppm		
2 nd Scan (Mean ± Error*)	6.5 ± 2 ppm		
Conclusion	Qualified.		

*An estimated systematic error from previous multiple measurements with one LIGO-1 mirror.

Discussions and Comments:

Two scans of TIS measurement are carried out on HR surface with positioning the arrow on barrel at Y+ direction. One is a full coverage scan over a 48 mm diameter aperture with the beam and step sizes of 0.3 mm and other a sampling scan over a 160 mm diameter aperture with the same beam size of 0.3 mm and step size of 1.0 mm, as shown in Figs. 1 and 2 respectively. The system was checked and calibrated with a 1” HR mirror (No.8128).

Each scan takes about 30 hrs. It was found that the room temperature increase of up to 1 degC during night had some influence on the measurement through mechanical alignment and/or PD and its electronics. The horizontal strips are most likely due to room temperature effect, though the room temperature was measured and a linear correction was applied.

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ITM01 HR TIS measurement ($\phi_{\text{beam}} = 0.3\text{mm}$, Step= 0.3 mm) (ppm)

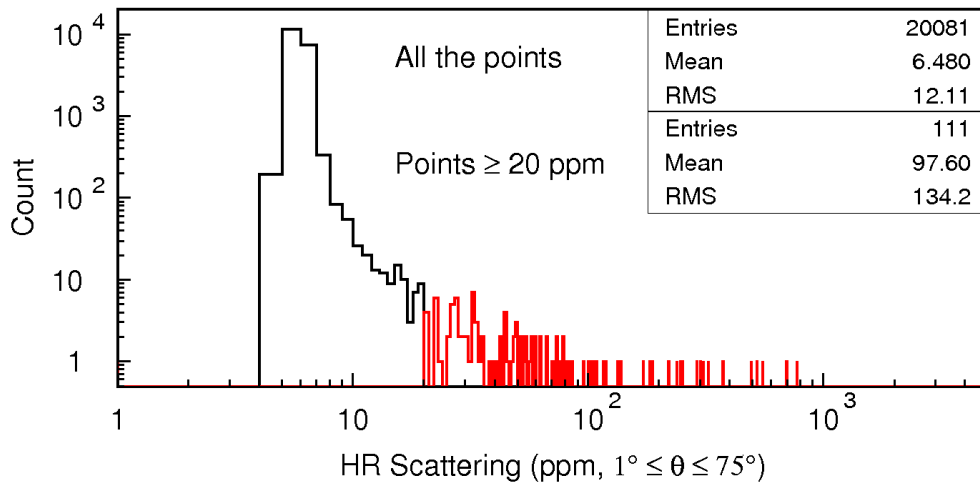
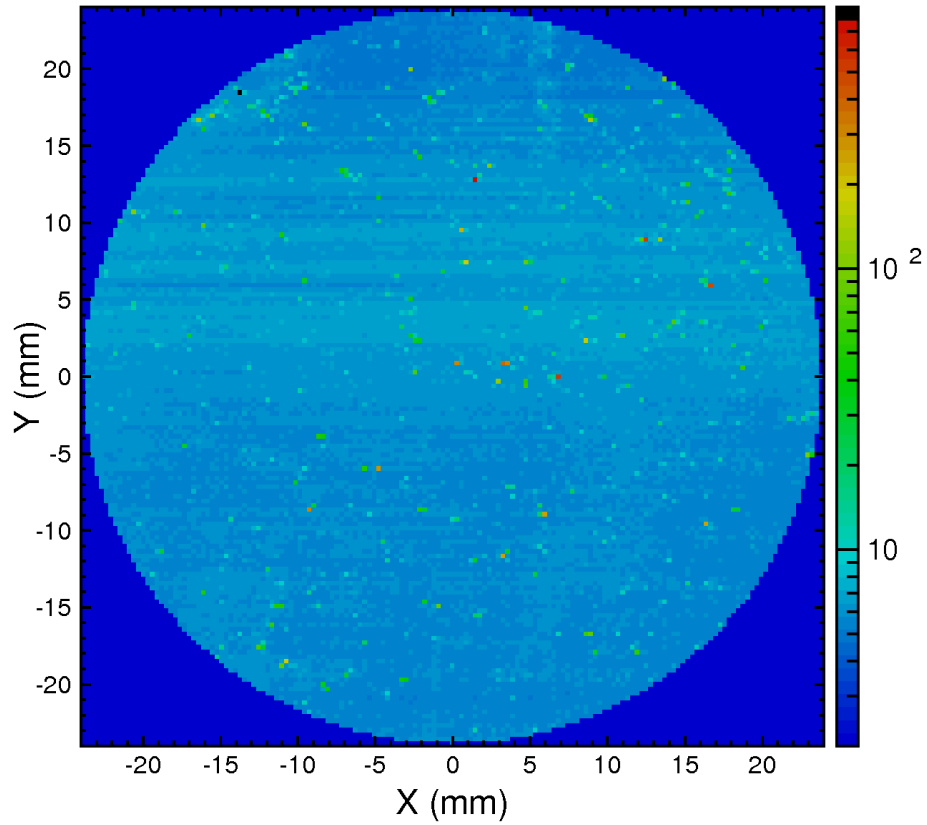


Fig. 1 ITM01 HR TIS measurement over a 48 mm diameter aperture.

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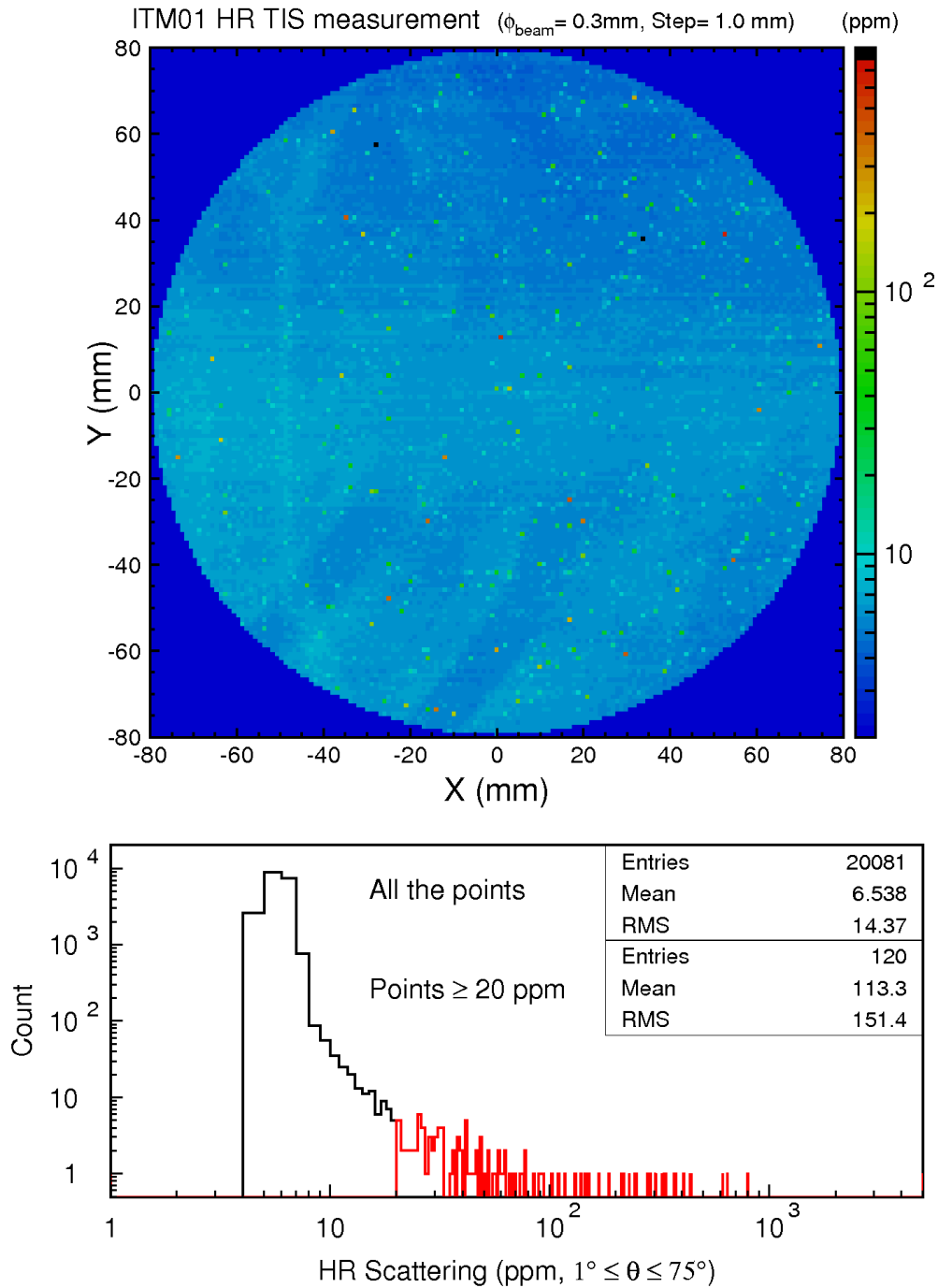


Fig. 2 ITM01 HR TIS measurement over a 160 mm diameter aperture.