Dump thresholds for LIC detectors in IP2

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OUTLOOK

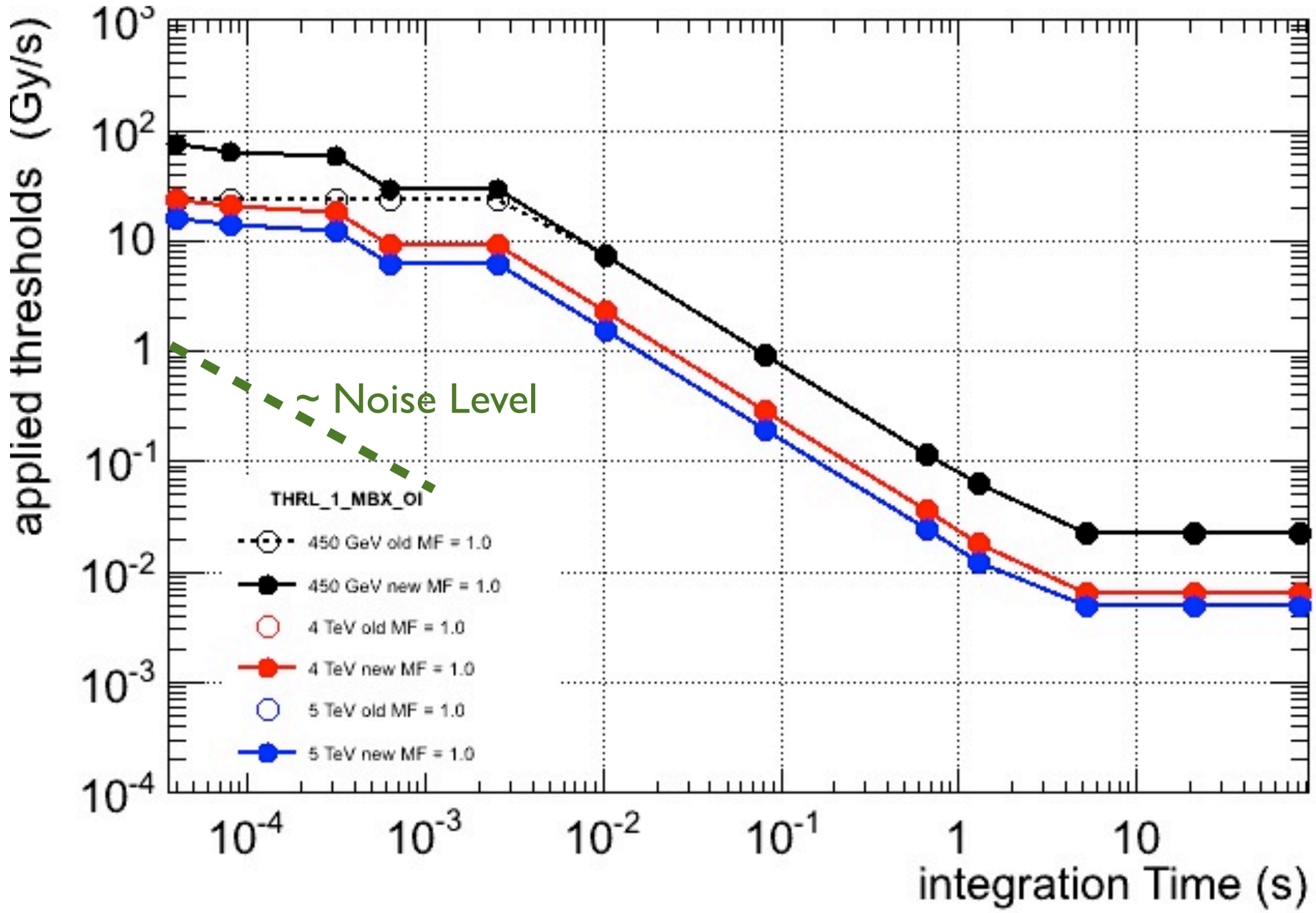
- Implementation of LIC thresholds taking into account (factor 60) the different sensitivity and noise considerations.

- Noise was found to be of 0.02Gy/s (~1.3 Gy/s for LIC detectors).

Monitor Name	Family Name
BLMQI.08L2.B2I10_MQML	THRL.DS.B2.I_MQM_IL
BLMEI.06L2.B1E0_MSIB	THRL_MSI
BLMEI.04L2.B1E10_TDI.4L2.B1	THRL_TDI
BLMQI.03R8.B1I30_MQXA	THRL_B1.3_MQXA_OI
BLMEI.04R8.B2E10_MBXB	THRL_I_MBX_OI
BLMEI.06R8.B2E0_MSIB	THRL_MSI
BLMEI.04R8.B2E10_TDI.4L2.B1	THRL_TDI

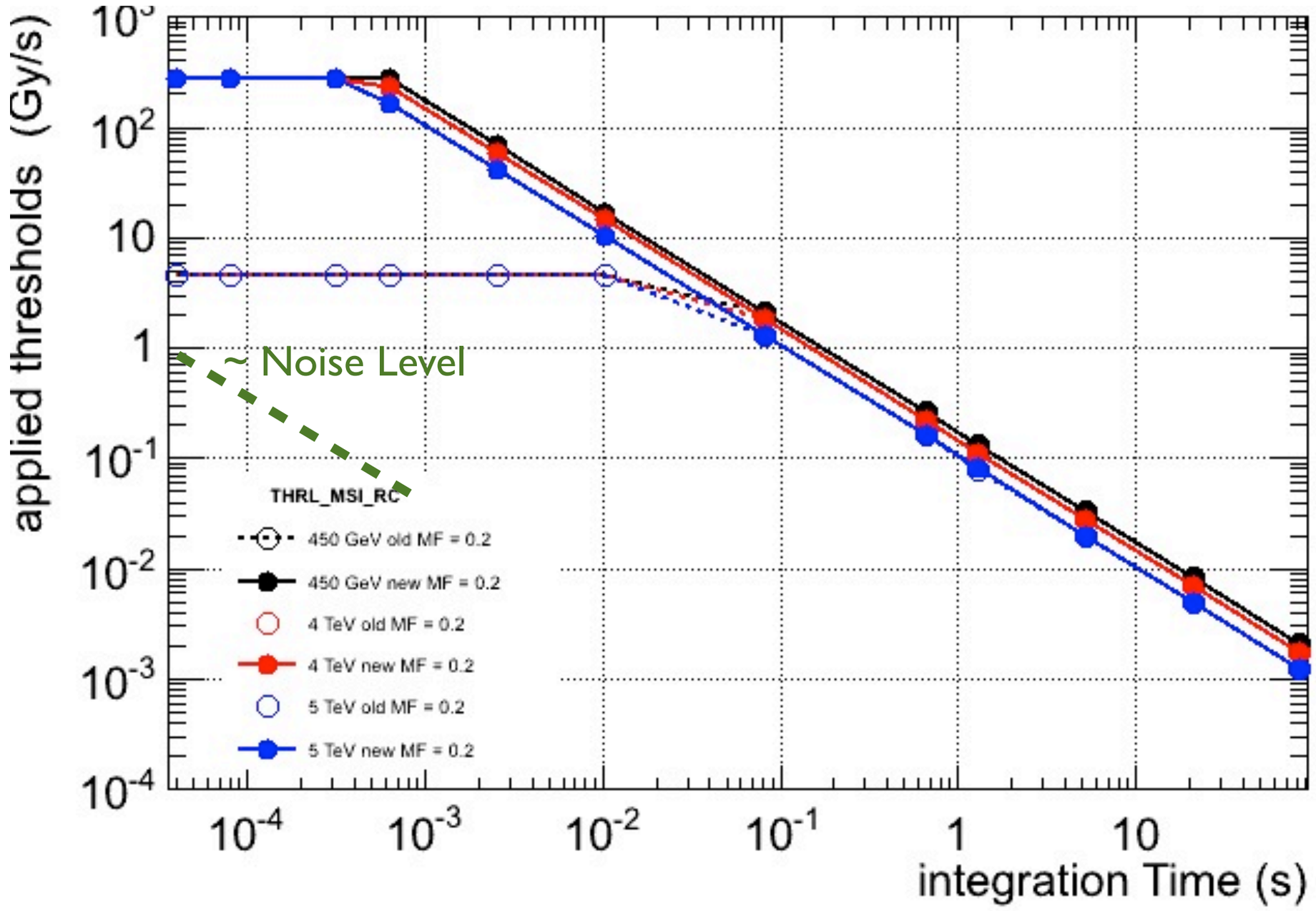
THRL_1_MBX_OI

With the reduction in sensitivity the threshold do not reach saturation (they were affected up to E =3.5 TeV). This monitor family presents no issue in terms of Noise. Threshold/Noise > 10



THRL_MSI

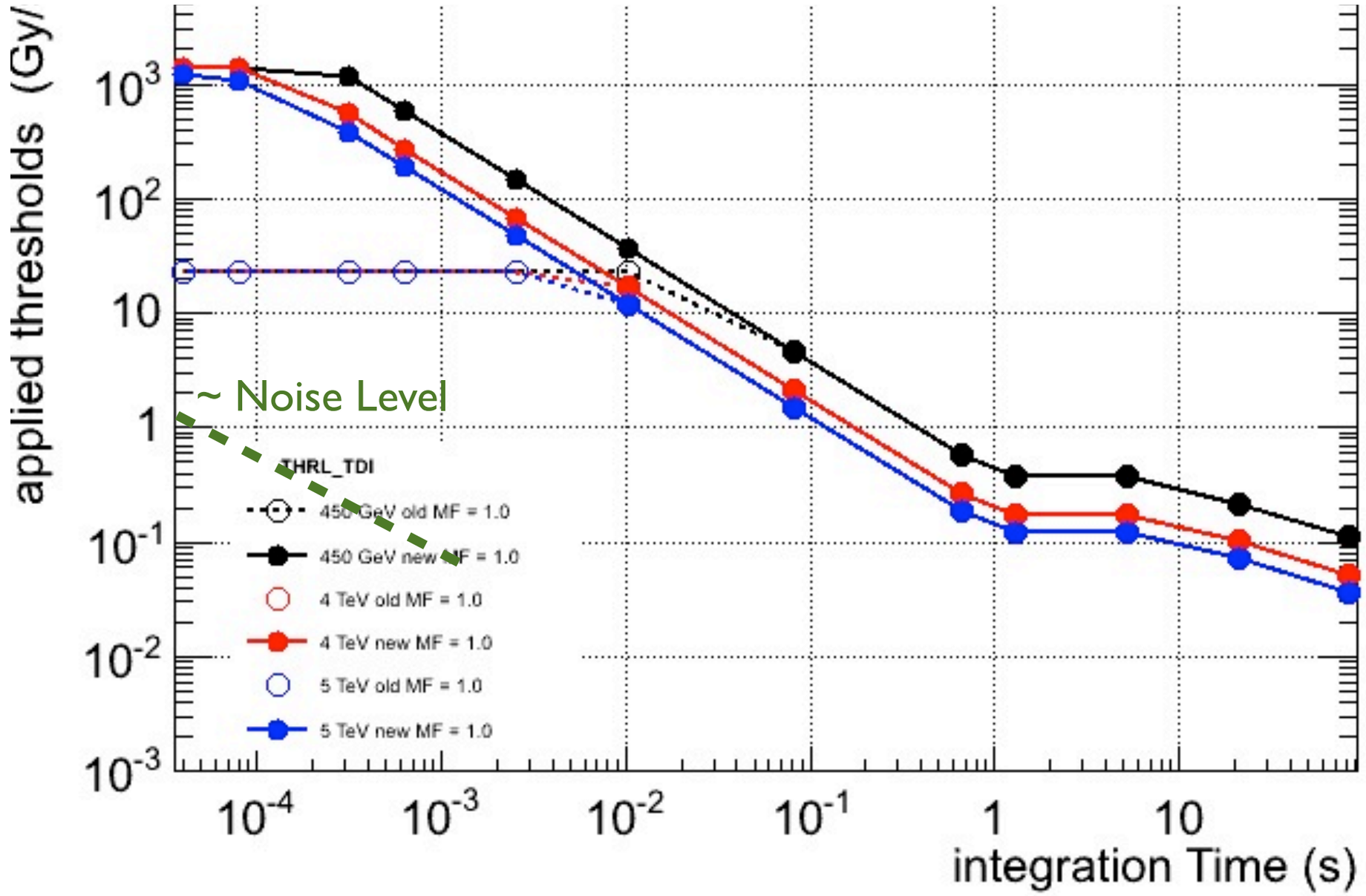
With the reduction in sensitivity the threshold do not reach saturation (they were affected for all energies). This monitor family presents no issue in terms of Noise since we gain the full factor 60 in RS01. Threshold/Noise > 10.



THRL_TDI

With the reduction in sensitivity the threshold do not reach saturation (they were affected up to E =3.5 TeV). This monitor family presents no issue in terms of Noise (Threshold/Noise > 10)

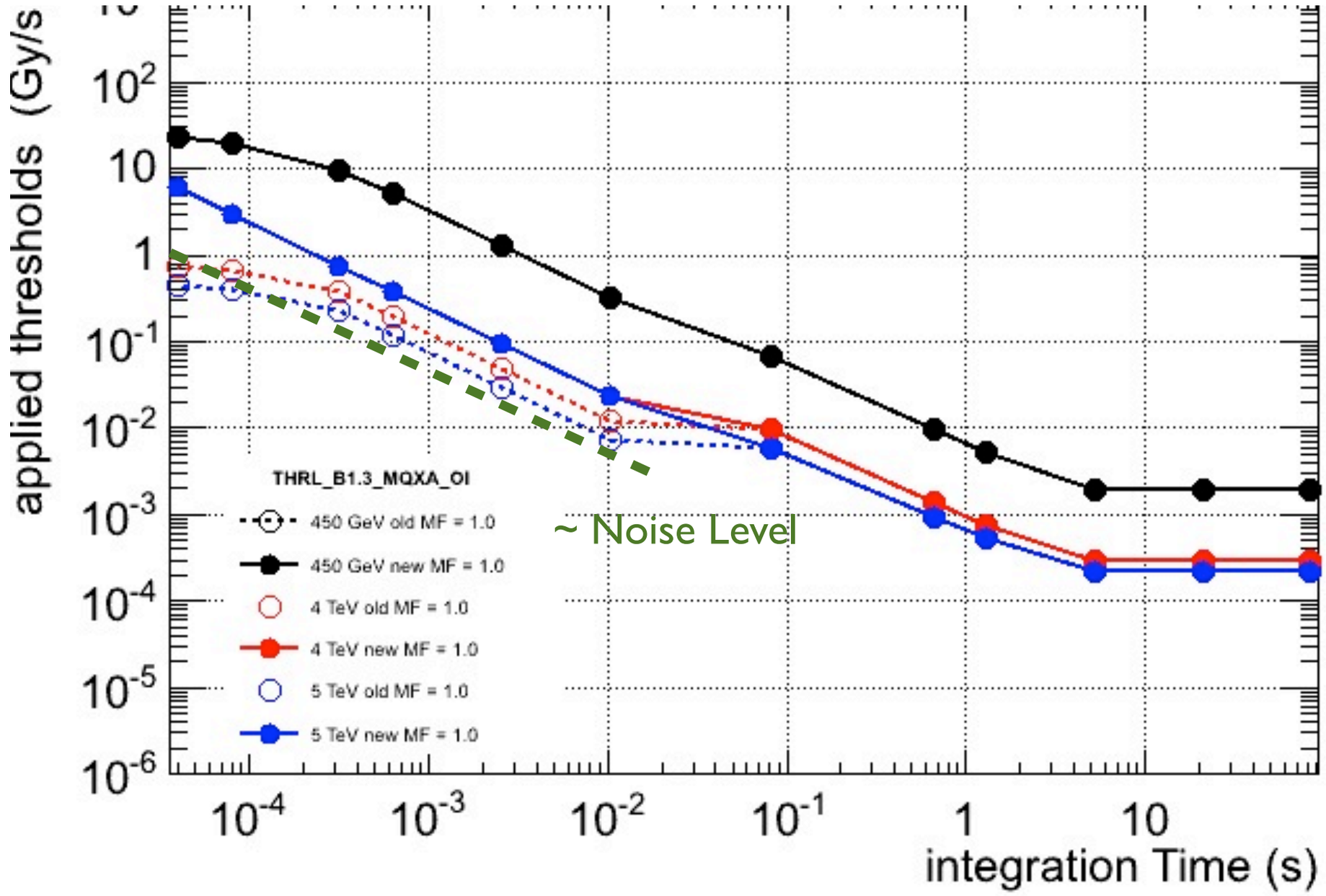
The 2 TDI monitors are not connected to BIS!



THRL_B1.3_MQXA_OI

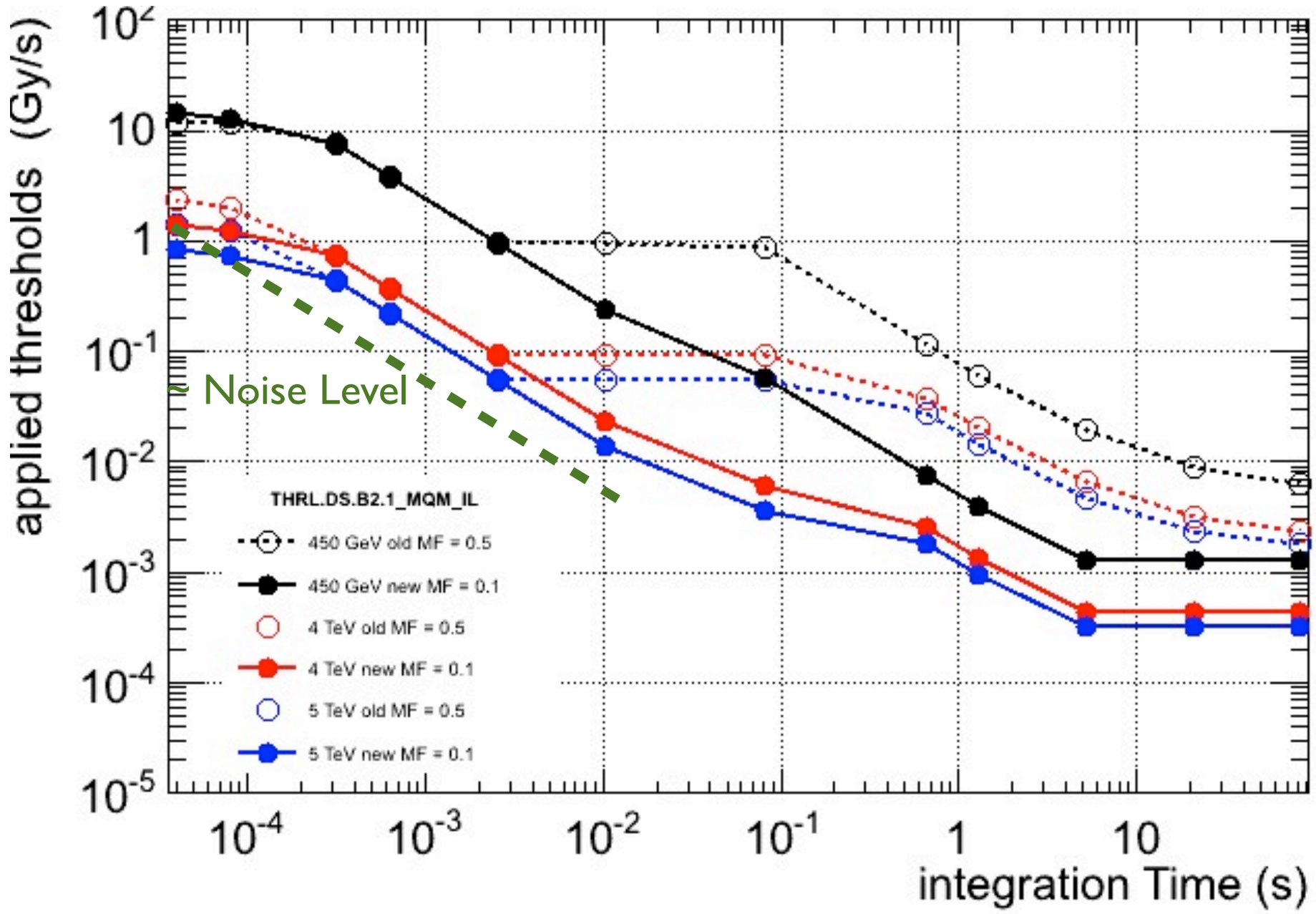
Noise Correction => N ~100 BITS = 0.01 Gy/s (IC)= 0.6Gy/s (LIC) => T = 10xN

No Saturation effect in original thresholds. Unchanged except for Noise Correction applied. At 4TeV the threshold is increased by a factor ~6 in RS01 (ie. 3 x QL, although element protected by other BLMs). Only RS higher than RS06 unaffected.



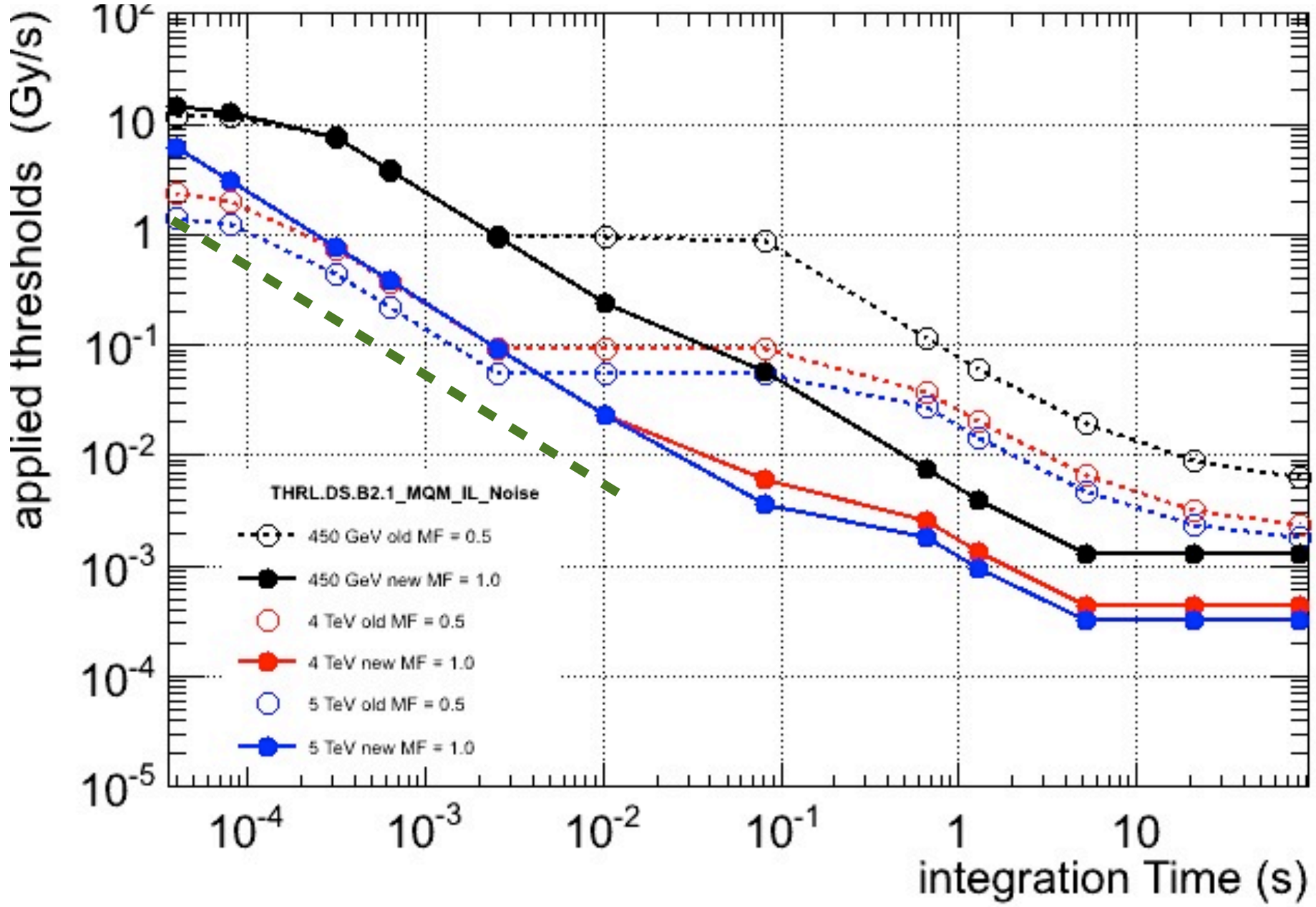
THRL.DS.B2.1_MQM_IL

Current IC thresholds = Note 44 (2010 run). The electronic maximum was limiting factor. With the reduction in sensitivity the threshold do not reach saturation at injection energy. We can move to standard approach (empirical correction + MF =0.1). However S/Noise < 2.



THRL.DS.B2.1_MQM_IL

Proposed solution. Master Threshold accordingly scale to set MF =1.0 and implementation of Noise correction to avoid dumps by Noise spikes.



CONCLUSIONS AND REMARKS

- Most modifications produce increase of dump thresholds at low (injection) energy. In two cases the change affects higher energies to avoid false dumps due to noise.

- MSI thresholds contain an “old” parameterization (propagated to LICs). Should be changed for consistency (new param allows for 10x loss rate at steady state).

MSD= MSI => New parameterization