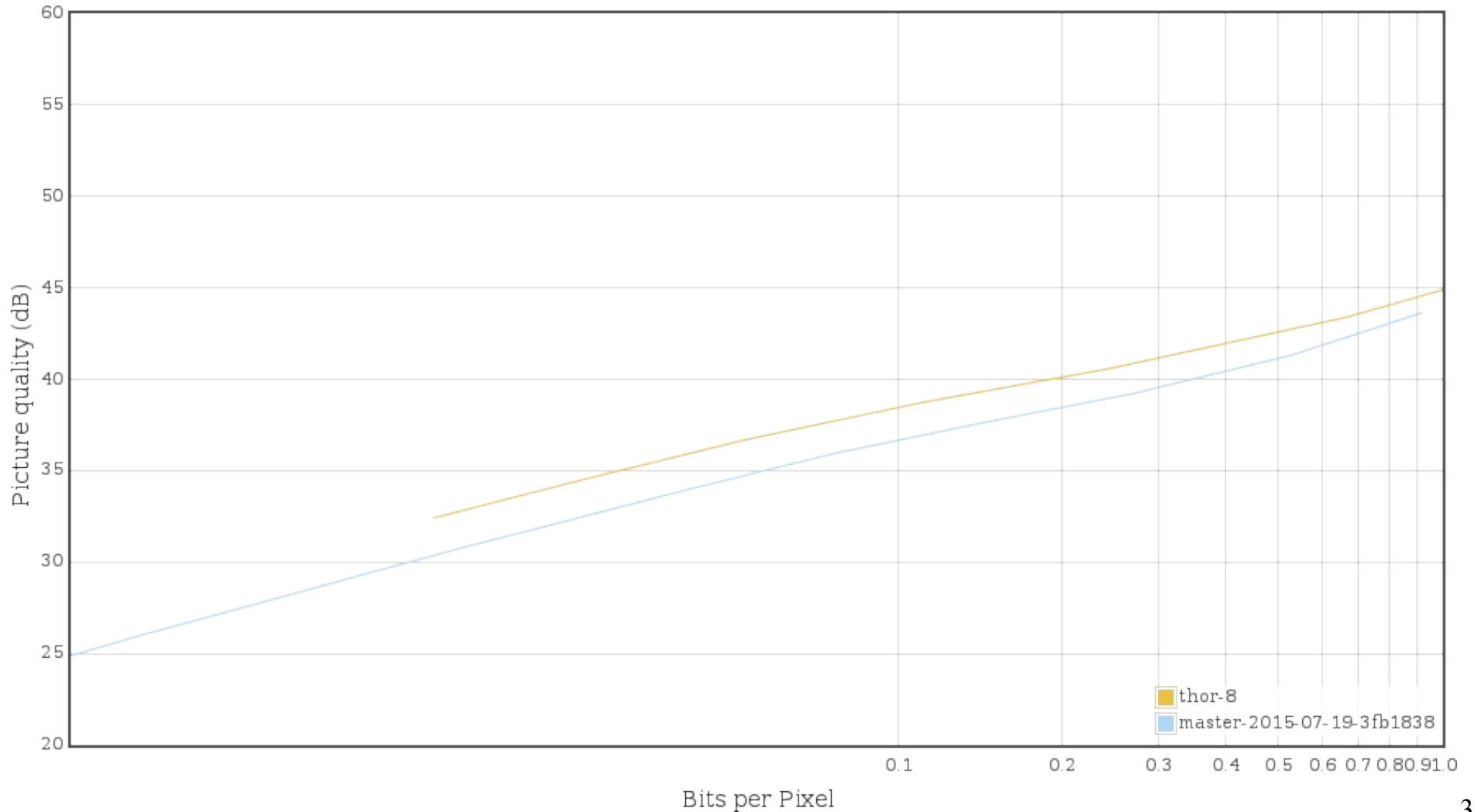


NETVC Hackathon Results IETF 93 (Prague)

- Integrated Thor into `AreWeCompressedYet`
 - Had to disable B-frames
 - Thor required frame count to be a multiple of the GOP size (12 frames)

Thor and Daala: PSNR

Metric: PSNR Video: Total
X-Axis: Bits per pixel X-Axis Range: Full Range Logarithmic

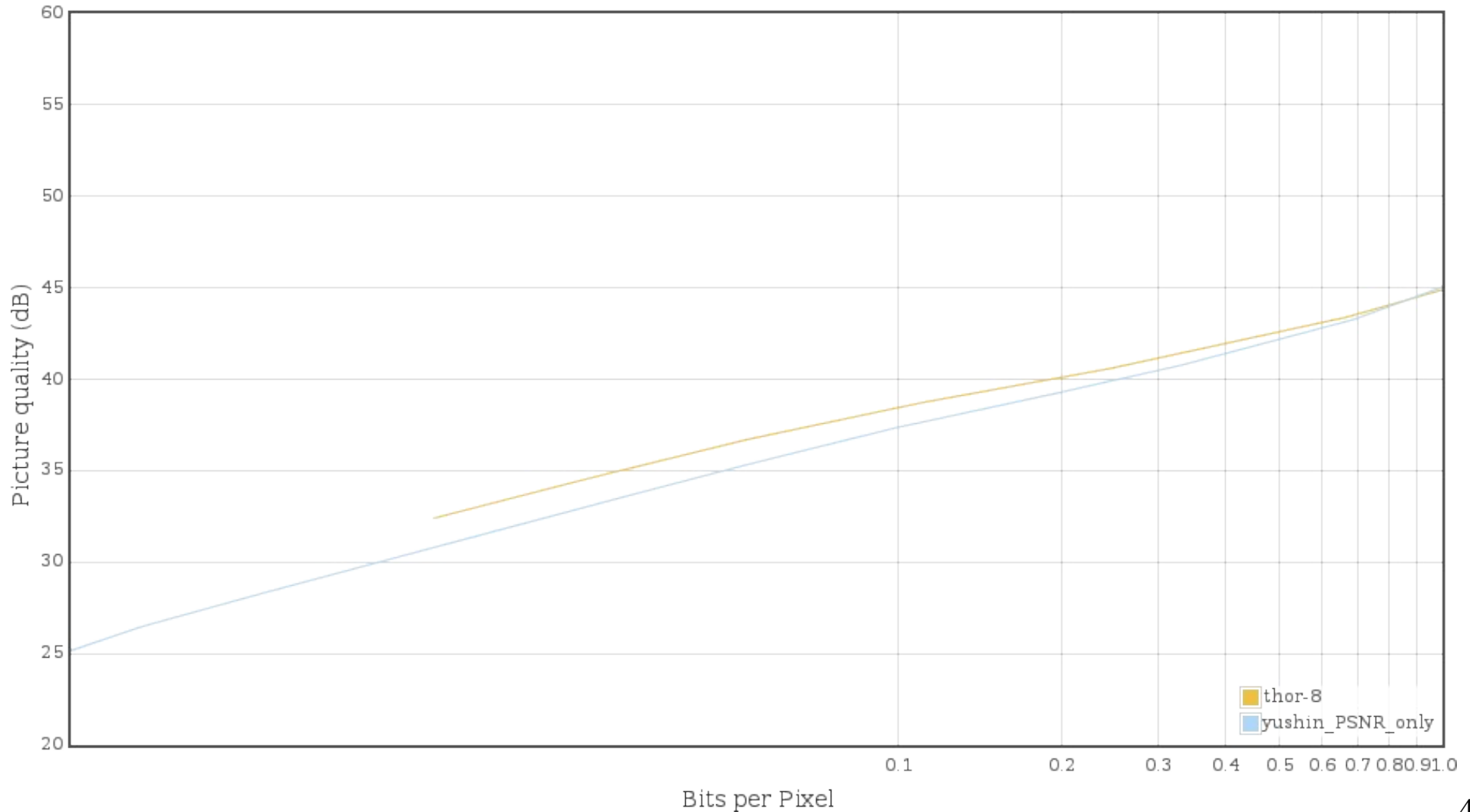


Rate: -43.54906%

DSNR: 1.72357 dB

Thor and Daala: PSNR

Metric: PSNR Video: Total
X-Axis: Bits per pixel X-Axis Range: Full Range Logarithmic

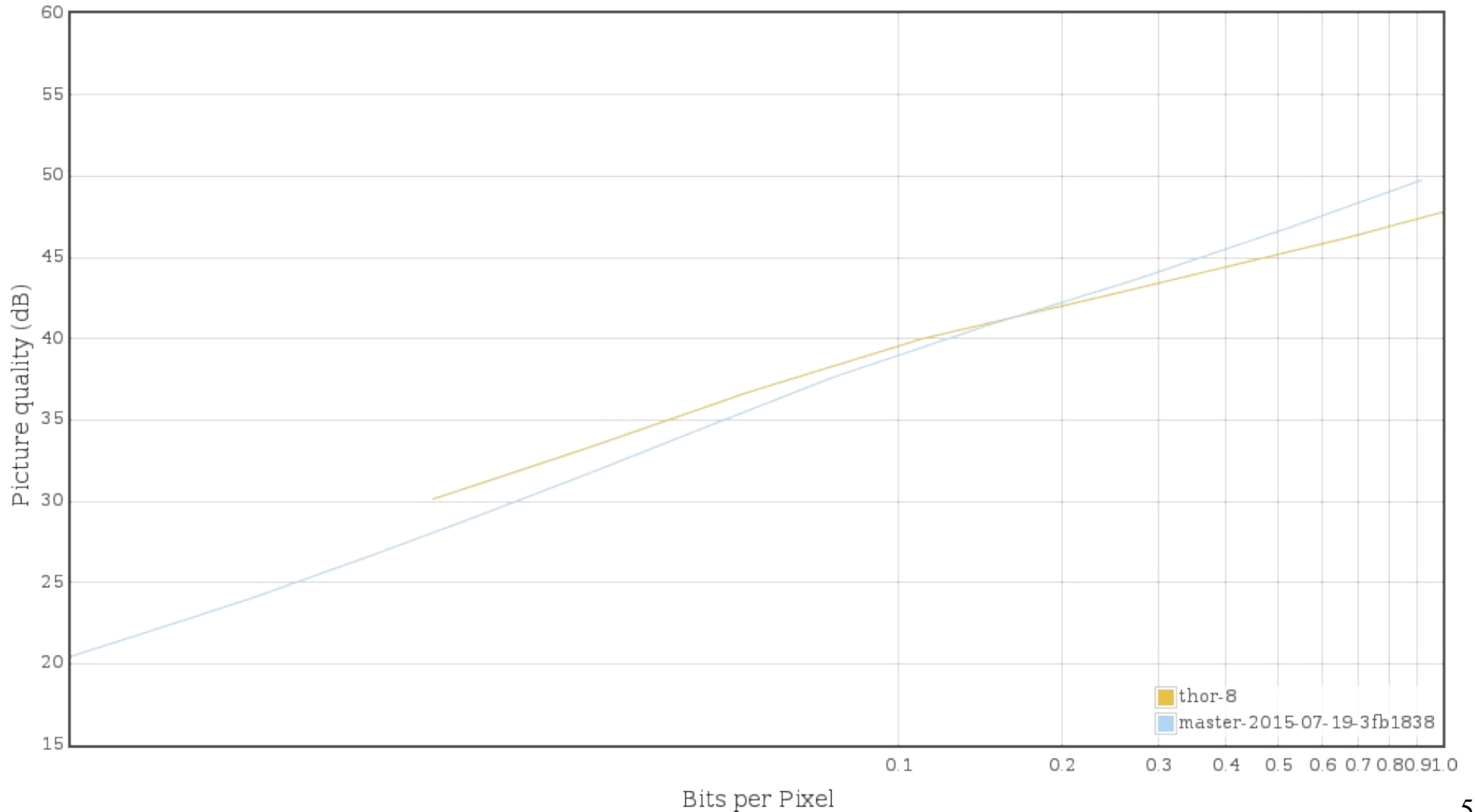


Rate: -23.64632%

DSNR: 0.92675 dB

Thor and Daala: PSNR-HVS

Metric: PSNR-HVS Video: Total
X-Axis: Bits per pixel X-Axis Range: Full Range Logarithmic

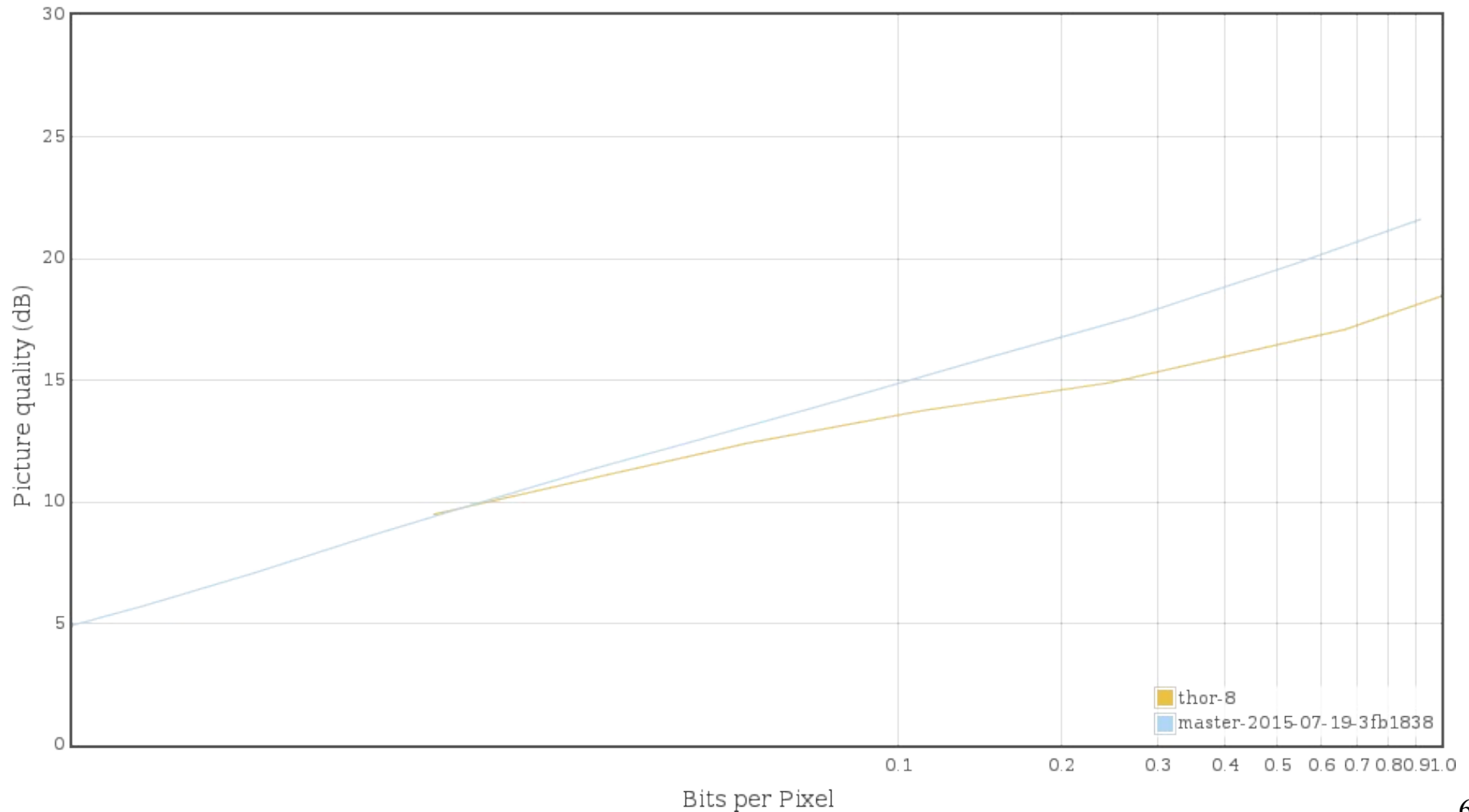


Rate: -0.79660%

DSNR: 0.22439 dB

Thor and Daala: MS FastSSIM

Metric: FastSSim Video: Total
X-Axis: Bits per pixel X-Axis Range: Full Range Logarithmic



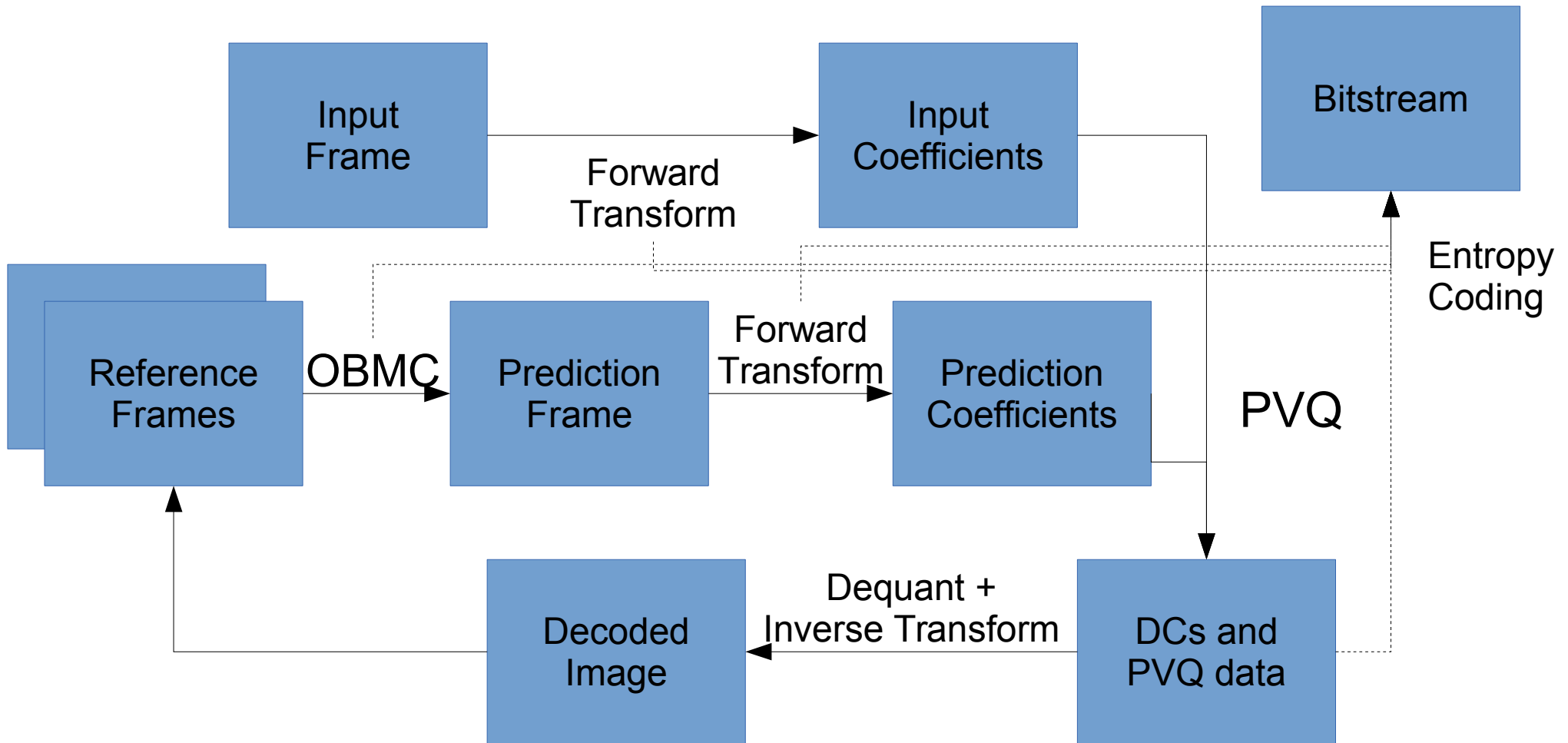
Rate: 91.02910%

DSNR: -1.59731 dB

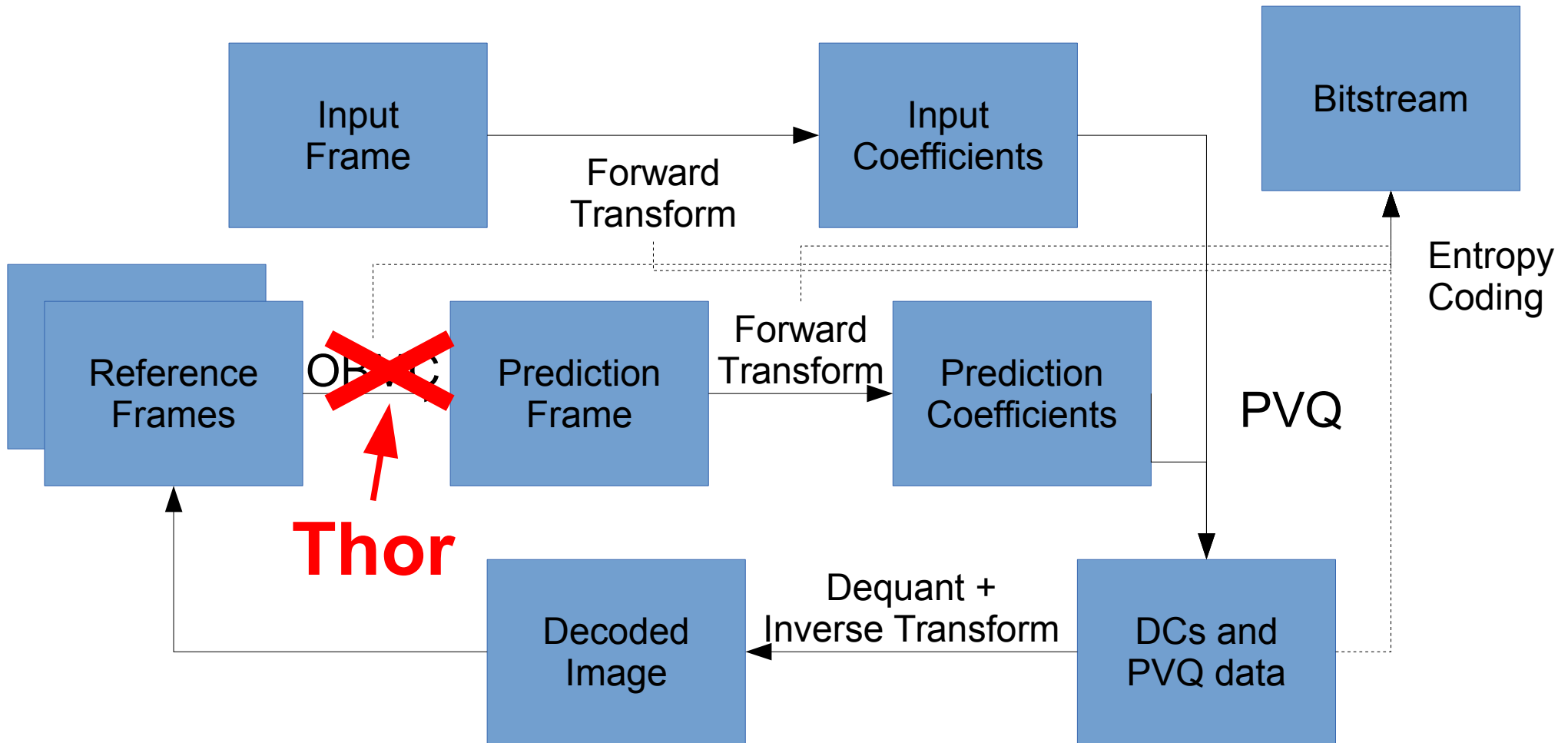
Daala with Thor MC

- Daala's motion compensation is very loosely coupled with the rest of the codec
- Ripped it out and replaced it with Thor's
 - Ran whole Thor encoder with residual coding disabled, stuffed output bits into a Daala frame
- Performed four different variations of this experiment

Daala Inter Encoder



Daala Inter Encoder

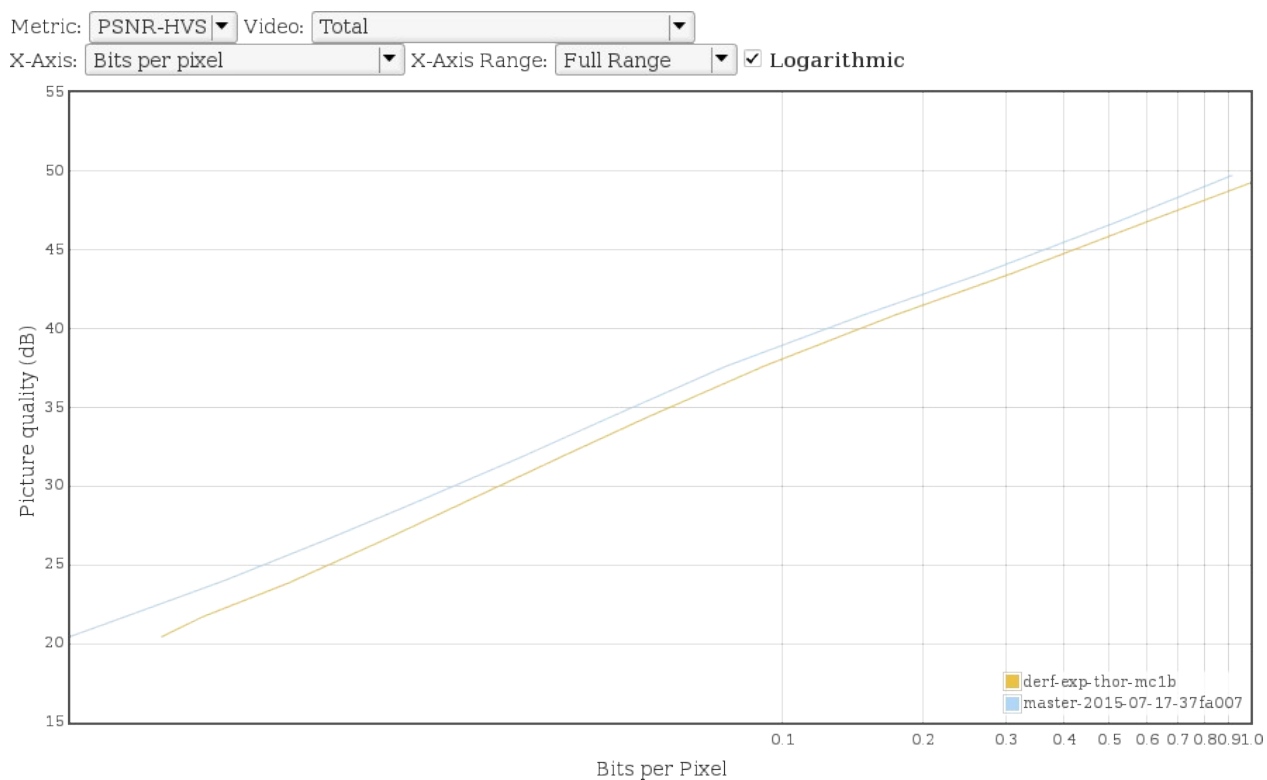


Experiment #1

- Disabled residual coding
- Disabled intra modes
- Disabled 64x64 blocks

master-2015-07-17-37fa007 → derf-exp-thor-mc1b

	RATE (%)	DSNR (dB)
PSNR	24.51603	-0.69834
PSNRHVS	24.33240	-1.11047
SSIM	27.75545	-0.61044
FASTSSIM	24.36346	-0.63270

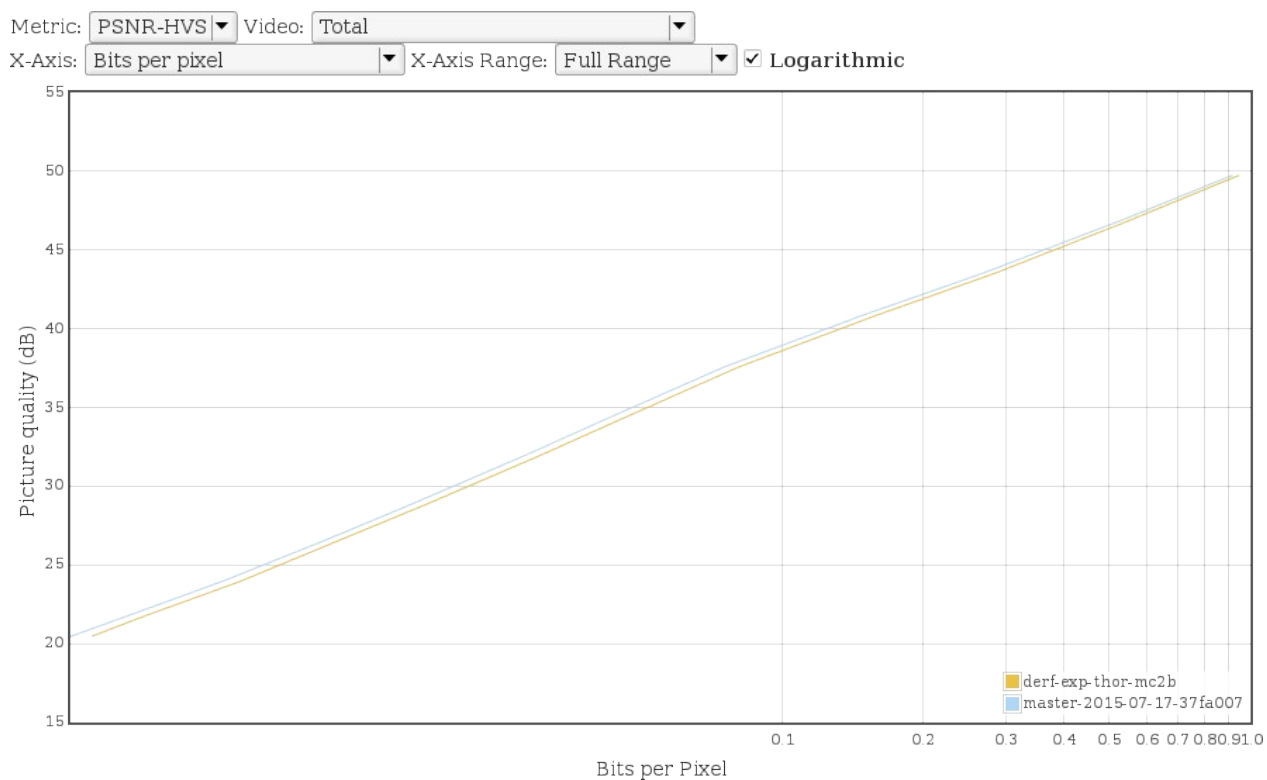


Experiment #2

master-2015-07-17-37fa007 → derf-exp-thor-mc2b

- Stop coding CBP bits
- Omit disabled modes from VLCs
- Omit 64x64 → 32x32 split bits

	RATE (%)	DSNR (dB)
PSNR	7.93727	-0.25080
PSNRHVS	7.13015	-0.35463
SSIM	9.18280	-0.22162
FASTSSIM	7.28931	-0.20654

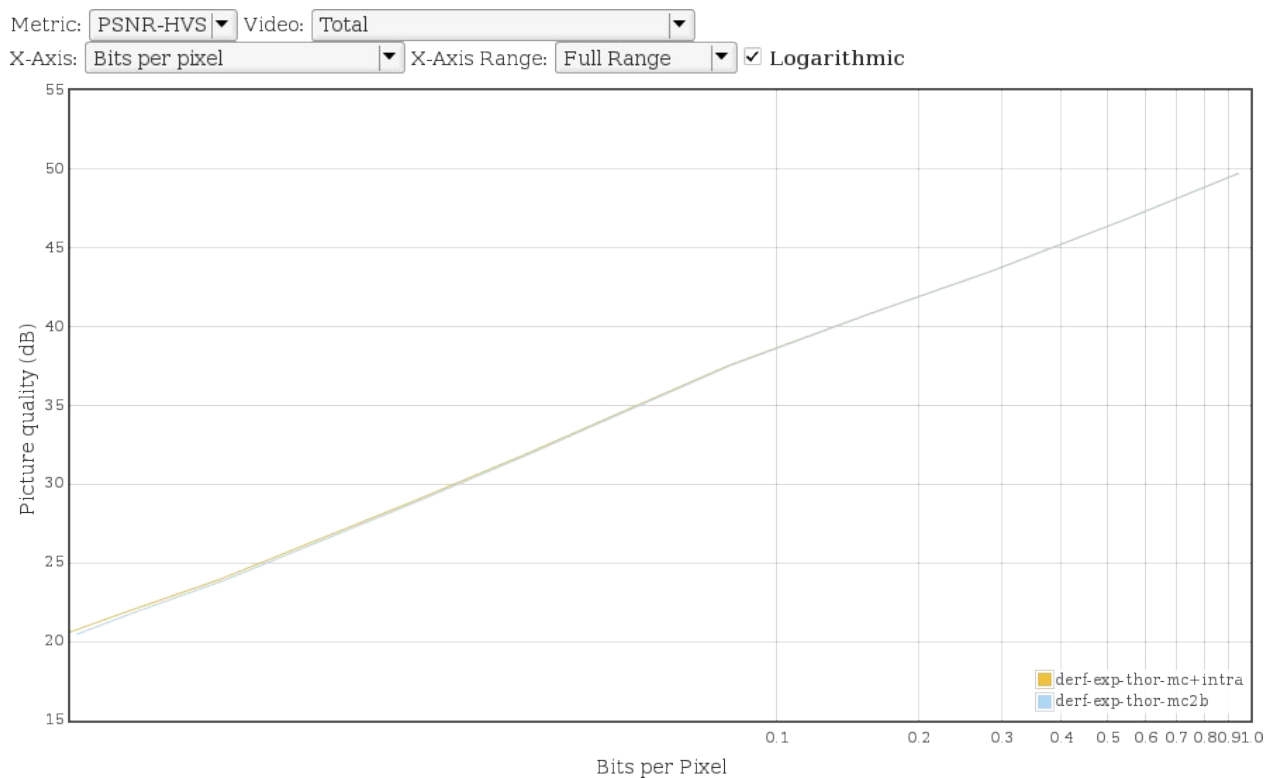


Experiment #3

- Re-enable intra modes
- Add them back to the VLCs

derf-exp-thor-mc2b → derf-exp-thor-mc+intra

	RATE (%)	DSNR (dB)
PSNR	-1.78884	0.05965
PSNRHVS	-1.64714	0.08583
SSIM	-1.95929	0.05048
FASTSSIM	0.49486	-0.01537

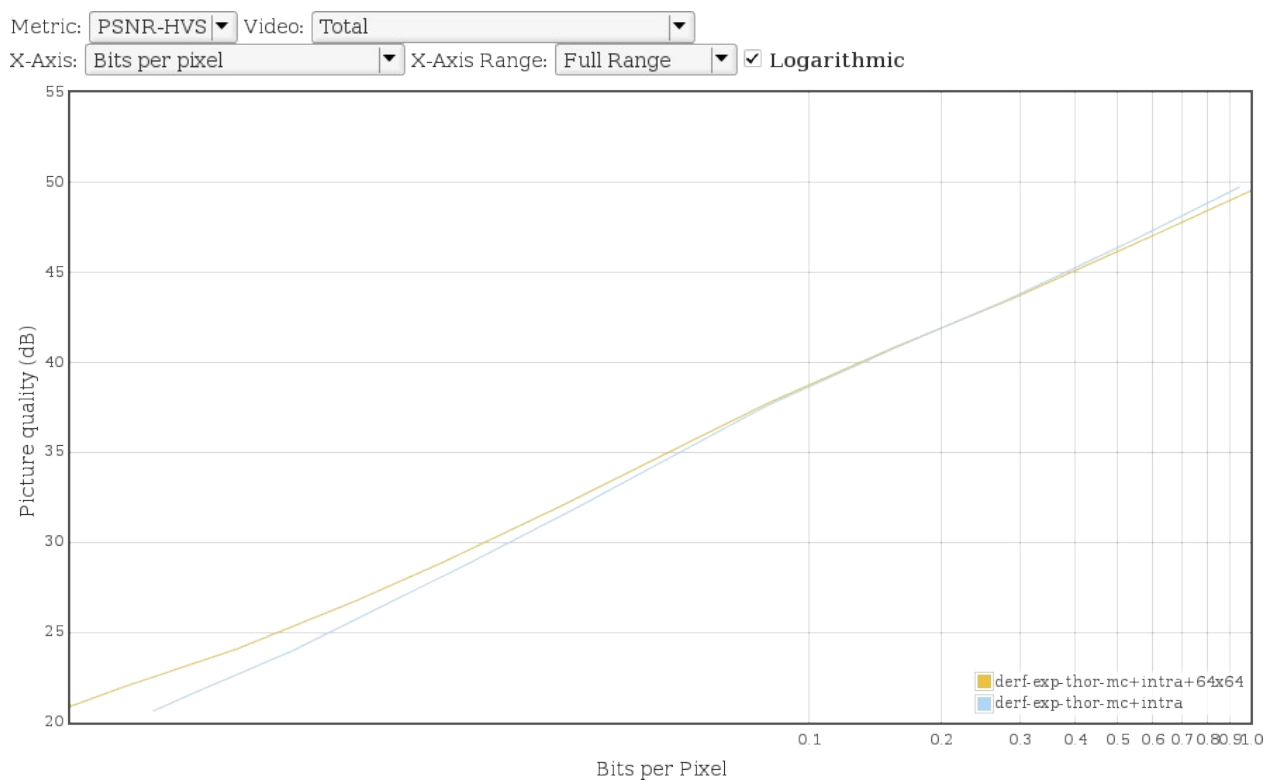


Experiment #4

derf-exp-thor-mc+intra → derf-exp-thor-mc+intra+64x64

- Re-enable 64x64 blocks
- Code 64x64 → 32x32 splits again

	RATE (%)	DSNR (dB)
PSNR	-11.75578	0.35987
PSNRHVS	-9.23958	0.43580
SSIM	-10.83236	0.25502
FASTSSIM	-7.25009	0.17587



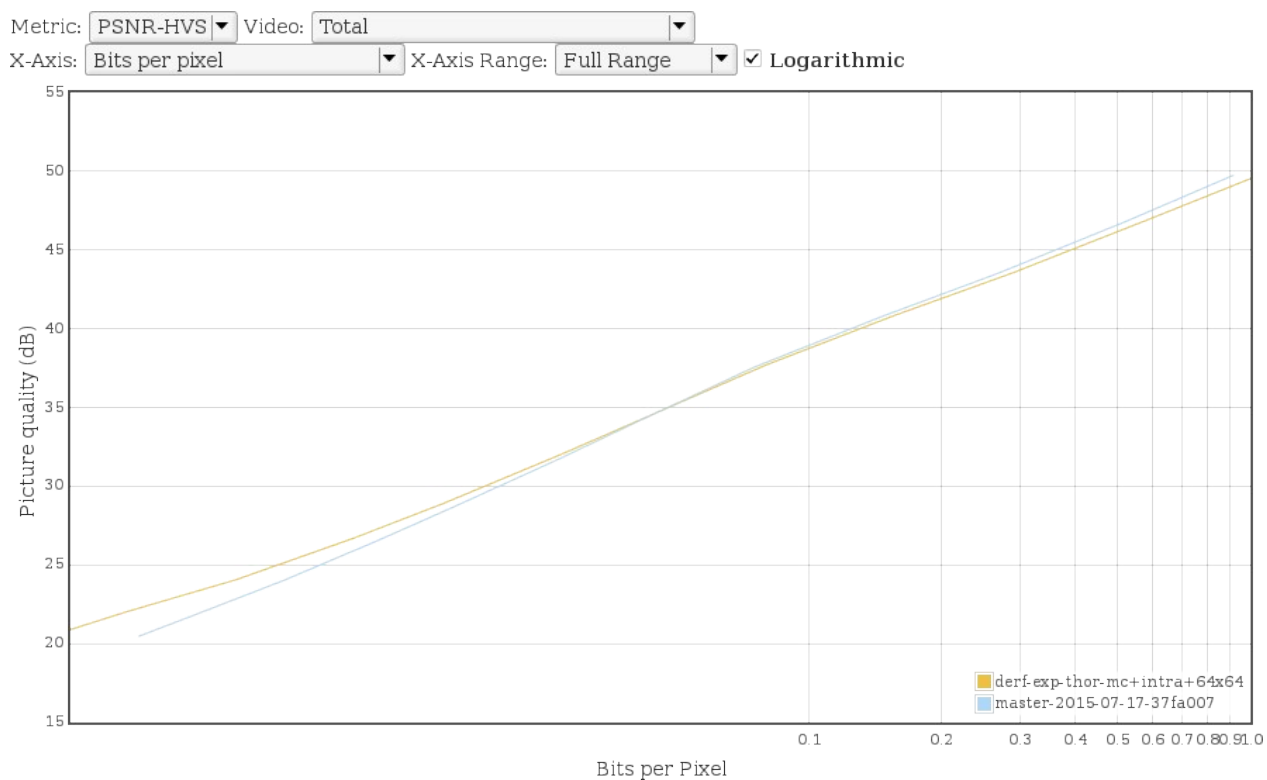
Experiment #4 vs. Daala

master-2015-07-17-37fa007 → derf-exp-thor-mc+intra+64x64

- Re-enable 64x64 blocks

- Code 64x64 → 32x32 splits again

	RATE (%)	DSNR (dB)
PSNR	-6.45022	0.18862
PSNRHVS	-4.37206	0.19331
SSIM	-4.55062	0.09759
FASTSSIM	0.52045	-0.03280



Thor's Constrained Low-Pass Filter

- Easy to integrate into Daala
 - Simple hack with no signaling for now (e.g., cheating)
 - Better patch with real signaling in progress
- Solves a long-standing “quilting” artifact
 - Found in fades at low rates

Previous Daala (no CLPF)



Fade from Sintel at -v70 (brightness and contrast enhanced)

Daala with Thor's CLPF



Fade from Sintel at -v70 (brightness and contrast enhanced)