Appendix

A. Experimental Configurations and Additional Results

In this section, we first summarize the configurations of all evaluated compression methods in Table 1. To determine the target bitrate for each method, we first performed a manual search for operating points that did not introduce clear visible artifacts in the reconstructed images. Based on this preliminary inspection, we used higher bitrates for the classical codecs, namely 1.0 BPP for JPEG and 0.5 BPP for BPG. For the remaining neural-based methods, we targeted a bitrate of approximately 0.1 BPP, which provided a reasonable trade-off between compression and perceptual quality. In addition, Tables 2 and 3 provide the exact results from Fig. 2.

Table 1. Experimental configurations for the evaluated compression methods.

Method	Representation	Hyperparameters	BPP setting	Entropy
JPEG	Quantized DCT coefficients from a fixed transform on each 8×8 block	Quality parameter q	Target BPP $= 1.0$; per-image binary search on q	Yes
BPG	Block prediction information and quantized HEVC residual transform coefficients	Quality parameter q	Target BPP $= 0.5$; per-image binary search on q	Yes
ILLM	Quantized learned encoder outputs	Pretrained model `msillm_quality_2`	Fixed by pretrained model (0.07 BPP)	Yes
StableCodec	Quantized learned latent features decoded via one-step diffusion	`stablecodec_ft2` checkpoint (highest available publicly)	≈ 0.035 BPP; fixed by pretrained model	Yes
DiffC	RCC-based seeds defining Gaussian noise for each image patch and reverse-diffusion step	Stable Diffusion 2.1; reconstruction timestep 20	≈ 0.1 BPP	Yes
DDCM	RCC-based indices of selected Gaussian codebook atoms with coefficients	Stable Diffusion 2.1; $T = 1000$, $K = 8192$, $M = 2$, $C = 3$	Fixed image size; binary search over M for ≈ 0.1 BPP	No
Turbo-DDCM	RCC-based indices of selected Gaussian codebook atoms with coefficients; atoms jointly encoded as one lexicographic index over $\binom{K}{M}$ subsets	Stable Diffusion 2.1; $T = 30$, $K = 16384$, $M = 114$, $C = 1$	Fixed image size; binary search over M for ≈ 0.1 BPP	No
Robust Turbo-DDCM	RCC-based indices of selected Gaussian codebook atoms with coefficients; unlike Turbo-DDCM, the M atoms are encoded separately	Stable Diffusion 2.1; $T = 30$, $K = 16384$, $M = 73$, $C = 1$	Fixed image size; binary search over M for ≈ 0.1 BPP	No

Table 2. **Exact aggregated results for all methods at BER 10^{-4}.** The table reports bit-flip robustness on Kodak24 and DIV2K using PSNR, LPIPS, FID, and the percentage of corrupted output files. Values are mean $\pm$ standard deviation, except corrupted files, which are reported as percentages. Bold indicates the best result for each metric and dataset.

Dataset	Method	PSNR ↑	LPIPS ↓	FID ↓	% Corrupted Files ↓
Kodak24	JPEG	9.15 ± 2.54	0.75 ± 0.17	157.98 ± 24.56	0.83
	BPG	10.43 ± 2.00	0.75 ± 0.11	120.03 ± 4.26	2.08
	ILLM	17.43 ± 5.45	0.42 ± 0.22	75.05 ± 5.25	7.08
	StableCodec	19.12 ± 4.81	0.38 ± 0.28	57.30 ± 6.82	0.42
	DiffC	20.92 ± 4.18	0.29 ± 0.18	33.95 ± 1.74	0.87
	DDCM	20.52 ± 3.70	0.30 ± 0.18	40.31 ± 6.17	**0.00**
	Turbo-DDCM	21.68 ± 4.18	0.25 ± 0.18	31.35 ± 2.53	0.42
	Robust Turbo-DDCM	**24.05 ± 2.90**	**0.15 ± 0.07**	**27.46 ± 0.19**	**0.00**
DIV2K	JPEG	8.52 ± 2.48	0.72 ± 0.17	173.06 ± 7.18	2.20
	BPG	9.13 ± 1.84	0.74 ± 0.12	150.19 ± 2.27	1.50
	ILLM	15.08 ± 5.11	0.45 ± 0.20	106.93 ± 4.87	9.70
	StableCodec	17.01 ± 4.71	0.40 ± 0.28	61.96 ± 5.10	1.70
	DiffC	18.62 ± 4.14	0.30 ± 0.18	37.27 ± 1.29	0.80
	DDCM	19.04 ± 3.56	0.28 ± 0.17	43.12 ± 1.64	**0.00**
	Turbo-DDCM	20.17 ± 4.12	0.24 ± 0.17	34.78 ± 1.59	0.20
	Robust Turbo-DDCM	**22.03 ± 3.07**	**0.17 ± 0.08**	**31.54 ± 0.19**	**0.00**

Table 3. **Exact aggregated results for all methods at BER 10^{-3}.** The table reports bit-flip robustness on Kodak24 and DIV2K using PSNR, LPIPS, FID, and the percentage of corrupted output files. Values are mean ± standard deviation, except corrupted files, which are reported as percentages. Bold indicates the best result for each metric and dataset.

Dataset	Method	PSNR ↑	LPIPS ↓	FID ↓	% Corrupted Files ↓
Kodak24	JPEG	7.84 ± 2.14	0.98 ± 0.08	420.95 ± 38.97	20.83
	BPG	9.33 ± 1.56	0.84 ± 0.08	140.70 ± 6.28	15.83
	ILLM	10.12 ± 2.78	0.75 ± 0.10	169.38 ± 9.16	61.67
	StableCodec	13.18 ± 3.62	0.74 ± 0.21	129.21 ± 15.79	10.83
	DiffC	14.85 ± 3.00	0.62 ± 0.15	57.94 ± 3.53	8.26
	DDCM	16.74 ± 2.69	0.52 ± 0.16	76.57 ± 7.09	**0.00**
	Turbo-DDCM	14.28 ± 3.17	0.66 ± 0.17	70.22 ± 4.81	2.92
	Robust Turbo-DDCM	**22.57 ± 2.58**	**0.20 ± 0.08**	**30.15 ± 0.57**	**0.00**
DIV2K	JPEG	7.47 ± 2.64	0.97 ± 0.10	456.82 ± 35.16	22.60
	BPG	8.72 ± 1.77	0.80 ± 0.10	164.36 ± 2.57	17.00
	ILLM	9.21 ± 2.59	0.72 ± 0.13	185.79 ± 7.23	64.10
	StableCodec	11.28 ± 3.17	0.75 ± 0.21	135.96 ± 4.88	13.00
	DiffC	13.48 ± 2.83	0.58 ± 0.15	55.33	5.20
	DDCM	15.58 ± 2.67	0.47 ± 0.16	65.78 ± 2.94	0.20
	Turbo-DDCM	13.41 ± 3.13	0.62 ± 0.18	77.59 ± 3.36	2.70
	Robust Turbo-DDCM	**20.74 ± 2.69**	**0.21 ± 0.09**	**34.71 ± 0.40**	**0.00**