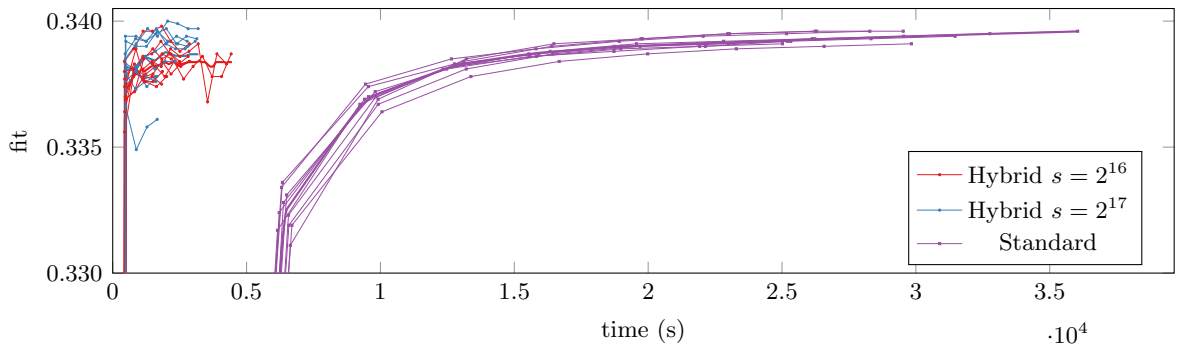
Method	Mean Time (s)	Speedup	Time Per Epoch (s)	Median Fit	Best Fit
Random $s = 2^{16}$	2.18×10^3	12.97	333.6	0.3374	0.3380
Hybrid $s = 2^{16}$	2.83×10^3	10.00	346.5	0.3384	0.3391
Random $s = 2^{17}$	2.51×10^3	11.27	358.2	0.3387	0.3388
Hybrid $s = 2^{17}$	2.38×10^3	11.87	378.8	0.3387	0.3397
Standard	2.83×10^4	1.00	N/A	0.3393	0.3396

(a) Statistics for 10 runs. Total time and speedup do not include finding the true fit for runs of the random and hybrid methods, which was only done to compare to the standard method.



(b) Individual runs with bias-corrected estimated fit plotted for hybrid and true fit for standard.

Figure 0.1: Comparison of CP-ARLS-LEV (random and hybrid) with varying number of samples $s \in \{ 2^{16}, 2^{17} \}$ and CP-ALS (standard) to compute a rank $r = 25$ CP decomposition of the Amazon tensor with 1.7 billion nonzeros. Random uses $\tau = 1$ and hybrid uses $\tau = 1/s$. Each experiment is run 10 times.