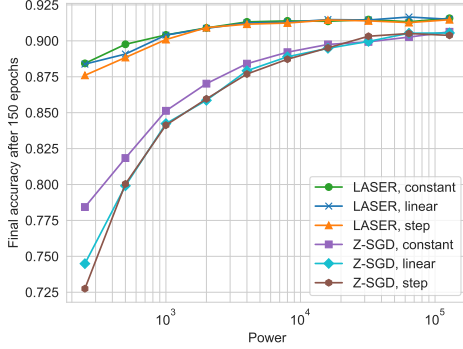
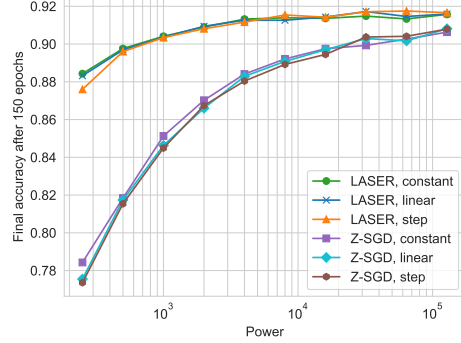


1 Power control for a fixed budget



(a) Power control increasing allocation with time.



(b) Power control decreasing allocation with time.

Figure 1: Final accuracy vs. power budget P for CIFAR-10 classification with various power control schemes. In (a), for each budget P we monotonically increase the power at epoch t , P_t , between $P/3$ and $5P/3$ with either a linear or a step function. Constant refers to fixing $P_t = P$ as considered in the paper. In (b), we monotonically decrease P_t likewise. We observe that LASER exhibits similar gains over Z-SGD as in the constant case for all the power control laws. We also notice that the power-decreasing control performs better than the increasing one for Z-SGD, especially in the low-power regime, where the accuracy is 4-5% higher than its counterpart, as is already observed in (Amiri et. al. 2019). For LASER, this difference is negligible.

2 Rank-accuracy tradeoff

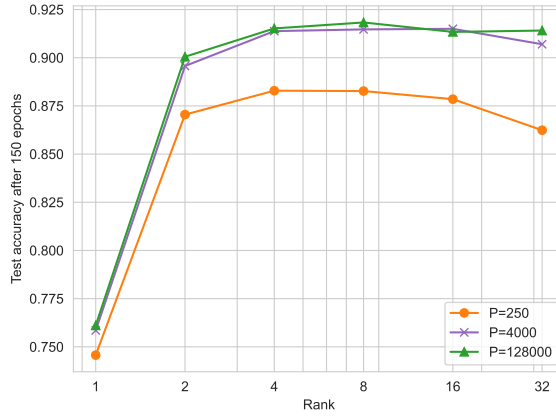


Figure 2: Final accuracy vs. compression rank tradeoff for CIFAR-10 classification, for low, medium and high power regimes. Rank-4/Rank-8 compression is optimal for all the three regimes. It reveals two interesting insights: (i) performance is uniformly worse in all the regimes with overly aggressive rank-one compression, and (ii) higher rank compression impacts low power regime more significantly than the medium and high-power counterparts. This confirms with the intuition that at low power (and hence noisier channel), it is better to allocate the limited power budget appropriately to few “essential” rank components as opposed to thinning it out over many.