

# Snake-in-the-Box Codes for Rank Modulation

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Motivated by the rank-modulation scheme with applications to flash memory, we consider Gray codes capable of detecting a single error, also known as snake-in-the-box codes. We study two error metrics: Kendall's  $\tau$ -metric, which applies to charge-constrained errors, and the  $\ell_\infty$ -metric, which is useful in the case of limited magnitude errors. In both cases we construct snake-in-the-box codes with rate asymptotically tending to 1. We also provide efficient successor-calculation functions, as well as ranking and unranking functions. Finally, we also study bounds on the parameters of such codes.

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