Locally recoverable codes with intersecting recovering sets

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Abstract

The codes having the locality property, i.e., the property to recover their coordinate values by using a small number of other coordinates are frequently used in distributed storage systems and cloud storage systems. Such codes are called locally recoverable (LRC) codes. A recovering set for a coordinate position i in a code is a set of other coordinate positions such that the value at the i^{th} position can be recovered by accessing the values at these coordinate positions. Tamo and Barg [2] have given a construction of LRC codes which is based on the classical construction of Reed-Solomon (RS) codes. These codes are called RS-like LRC codes. LRC codes with availability is a generalization of LRC codes, in which there are more than one recovering sets for each coordinate position, and it is generally assumed that these recovering sets are pairwise disjoint. Recently Kruglik et al. [1] have given a further generalization of these codes in which the recovering sets need not be disjoint. In this talk, we present a construction of such type of codes by using the construction of RS-like LRC codes. We also discuss a bound on the rate of the codes from this construction, and present a sufficient condition for a cyclic code over a finite field to be an LRC code with intersecting recovering sets.

References

[1] S. Kruglik, M. Dudina, V. Potapova and A. Frolov, *On one generalization of LRC codes with availability*, IEEE Information Theory Workshop (ITW), (2017), 26–30.

[2] I. Tamo and A. Barg, *A family of optimal locally recoverable codes*, IEEE Trans. Inform. Theory, 60 (2014), 4661–4676.