Journal of Automata, Languages and Combinatorics **9** (2004) 1, 81–102

ASYMPTOTICALLY OPTIMAL LOW-COST SOLID CODES [1]

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ABSTRACT

A new construction of solid codes is introduced. With this construction one obtains classes of solid codes which are asymptotically optimal in terms of information rate and which have low-cost systematic encoding and decoding algorithms. The construction uses a new result on the asymptotic average length of maximal runs in words.

Keywords: Solid code, information rate, redundancy, insertion error, deletion error, synchronization, runs in word, run length

1. Introduction

In addition to symbol substitution errors as considered in traditional fault models for digital communication, synchronization errors are likely to occur in communication systems working at very high speed, with very low signal strengths or under adverse conditions. To deal with synchronization problems in such circumstances one can send special synchronization sequences incurring some loss in speed or bandwidth, or one can utilize the synchronization capabilities of certain types of codes.

[1] This research was supported by the Natural Sciences and Engineering Council of Canada.