

# NASA TECH BRIEF

## *NASA Pasadena Office*



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### Principles of Error Detection and Error Correction Codes

A recent report reviews the theoretical basis of groups, rings, fields, and vector spaces, and their relationships to algebraic coding theory. The impetus for these investigations is the application to digital telemetry techniques. For instance, the use of cyclic algebraic error correction codes is a practical means of effectively increasing the signal-to-noise ratio and reducing the errors in long distance digital communications systems.

In a cyclic code, a cyclic permutation of each codeword yields another codeword. Because cyclic codes can have a precise mathematical characterization, they are readily amenable to implementation with encoders and decoders employing feedback shift registers.

The report should serve as a working summary for engineers and scientists involved in data handling and processing systems.

#### Note:

Requests for further information may be directed to:

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No patent action is contemplated by NASA

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