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针对IRA-LDPC码类的半随机半代数结构设计

Semi-random and semi-algebraic structural design for IRA-LDPC codes

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中文关键词: [不规则重复积累码 \(IRA码\)](#) [低密度奇偶校验码 \(LDPC码\)](#) [奇偶校验矩阵](#) [整数模n剩余类](#) [整数模n循环群](#)

英文关键词: [irregular repeat-accumulate codes](#) [low-density parity-check codes](#) [parity-check matrix](#) [residue class of integers modulo n](#) [cyclic group](#)

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作者

[彭立](#), [张琦](#), [王渤](#), [陈涛](#)

单位

[华中科技大学](#) [电信系](#) [武汉国家光电实验室](#), [湖北](#) [武汉](#) [430074](#)

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中文摘要:

提出用半随机半代数结构的设计方法来构造IRA-LDPC码的信息位所对应的奇偶校验矩阵 H_d 。与现有结构化LDPC码相比,所给出可使 H_d 矩阵中每个1元素的位置坐标均能用数学表达式计算得到,不仅极大地降低了随机奇偶校验矩阵对存储资源的消耗,而且还为与现有工业标准中的LDPC码相比,所提出的IRA-LDPC码在误码率与信噪比的仿真性能方面也占有优势。

英文摘要:

A method of semi-random and semi-algebraic structure was presented for constructing the low-density parity-check matrix that corresponds to the existing structural LDPC codes, the distinct advantage of the presented compact structural array for information-bit-corresponding matrix is that each 1 element in the matrix can be calculated by a determinate algebraic expression, which not only reduces the consumption of memory resource for the random parity-check matrix but also provides a high probability for designing low complexity hardware circuit of the LDPC encoder/decoder. In addition, compared with the existing practical LDPC code is also slight preponderance in the performance of simulation in bit error rate and signal noise ratio (BER-SNB).

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