



(54) **SYSTEMS AND METHODS FOR OPERATING LOW-DENSITY PARITY-CHECK BIT-FLIPPING DECODER**

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(57) **ABSTRACT**
Systems and methods for operating a low-density parity-check (LDPC) bit-flipping decoder are disclosed herein. An LDPC codeword is received, and each bit in the LDPC codeword is classified as either a high-confidence bit or a low-confidence bit based on at least one criterion. The LDPC codeword is iteratively processed over a plurality of iterations based on parity check equations associated with each bit of the LDPC codeword to generate a processed LDPC codeword. For each iteration of the plurality of iterations, the iterative processing includes flipping at least one bit of the LDPC codeword, while preventing, for a first n number of the plurality of iterations, bits classified as high-confidence bits from comprising more than 33% of the total number of flipped bits. The processed LDPC codeword is decoded.

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