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(54) **FPGA-BASED RATE-ADAPTIVE
SPATIALLY-COUPLED LDPC CODES FOR
OPTICAL COMMUNICATIONS**

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(57) **ABSTRACT**

Disclosed are systems, methods, and software for generating spatially-coupled low-density parity-check (SC-LDPC) codes. A method for generating SC-LDPC codes includes generating one or more quasi-cyclic low-density parity-check (QC-LDPC) codes, and also includes assigning at least one of the generated one or more QC-LDPC codes as one or more template codes. The method further includes copying at least a portion of the one or more template codes to introduce irregularity. The method also includes shifting one or more template codes on a sub-block basis to generate at least one SC-LDPC code. As compared to known LDPC code generation modalities, the disclosed invention provides a simplified technique for implementation in streamlined hardware which has more general applicability across both present, and anticipated, communication systems, including those adapted for use with optical communications, wireless communications, and 5G as well as future 6G.

Related U.S. Application Data

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