1023-94-1236 **Daniel J. Costello*** (costello.2@nd.edu), Dept. of Elec. Engr., 275 Fitzpatrick Hall, Univ. of Notre Dame, Notre Dame, IN 46556, and **Ali Emre Pusane** (Ali.E.Pusane.1@nd.edu), Dept. of Elec. Engr., 275 Fitzpatrick Hall, Univ. of Notre Dame, Notre Dame, IN 46556. *LDPC Convolutional Codes: What Are They? How Do They Work? Are They Any Good?*

LDPC convolutional codes have been shown to be capable of achieving the same capacity-approaching performance as LDPC block codes with iterative message-passing decoding. We define two distinct classes of LDPC convolutional codes - time-invariant and time-varying - and connections with quasi-cyclic LDPC block codes are discussed. Encoding and decoding procedures are reviewed. Two iterative message-passing decoders are presented: a one-shot decoder that treats a terminated LDPC convolutional code as a big block code and a pipeline decoder that takes advantage of the unique structural properties of convolutional codes and can be used for continuous transmission. VLSI implementation requirements for these decoders are discussed. Finally, we compare several aspects of LDPC convolutional codes with LDPC block codes, including encoding complexity, decoding complexity, decoder storage requirements, decoding delay, and error performance. A pseudo-codeword analysis is used to investigate the behavior of iterative message-passing decoding for LDPC convolutional codes. In particular, we show that LDPC convolutional codes have better convergence properties than LDPC block codes in the low-to-moderate SNR region due to an improved pseudo-codeword weight spectrum. (Received September 26, 2006)