

NORMALIZATION FACTOR ADAPTATION FOR LDPC DECODING FOR HARD DISK DRIVE SYSTEMS

ABSTRACT

[0035] An adaptation technique for decoding low-density parity-check (LDPC) codes for hard disk drive (HDDs) systems is disclosed. The method includes tuning the normalization factor for LDPC decoding for each data zone and read head during the test stage of manufacturing. The LDPC decoder can be either a sum-product algorithm (SPA) decoder or a Min-Sum decoder. The channel detector can be any soft-output detector, such as a soft-output Viterbit detector (SOVA), a BCJR detector, a pattern-dependent noise-predictive (PDNP) detector, or a bi-directional pattern-dependent noise-predictive (BiPDNP) detector. The adaptation technique can optimize the LDPC decoding performance for each data zone and read head, thereby relaxing the acceptance criteria for hard disk drive read/write heads and disk media, enabling acceptance and use of a much broader range of head and media for hard disk drives.

(Fig. 7)