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Sommario/riassunto	It is now understood that the turbo decoding algorithm is an instance of a probability propagation algorithm (PPA) on a graph with many cycles. In this paper we investigate the behavior of an PPA in graphs with a single cycle such as the graph of a tail-biting code. First, we show that for strictly positive local kernels, the iterations of the PPA converge to a unique fixed point, (which was also observed by Anderson and Hladik (1998) and Weiss (1997)). Secondly, we shall generalize a result of McEliece and Rodemich (1995), by showing that if the hidden variables in the cycle are binary-valued, the PPA will always make an optimal decision. (This was also observed independently by Weiss). When the hidden variables can assume 3 or more values, the behavior of the PPA is much harder to characterize.