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**F. Blanchet-Sadri, M. Cordier and R. Kirsch\*** (rmkirsch@gmail.com). *Combinatorics on Border Correlations of Partial Words.*

Partial words are sequences over a finite alphabet that may contain some “do not know” symbols. In this paper, we consider the border sets of partial words of length  $n$ , and study the combinatorics of specific representations of them, called border correlations, which are binary vectors of length  $n$  indicating the borders. We characterize precisely which of these vectors are valid border correlations, and establish a one-to-one correspondence between the set of valid border correlations and the set of valid ternary correlations of a given length, the latter being ternary vectors representing the strong and strictly weak period sets. We investigate the population size, that is, the number of partial words sharing a given border correlation, and obtain formulas to compute it. We also give a correspondence between the ternary correlation of a partial word and its refined border correlation, which specifies the lengths of all the word’s bordered cyclic shifts’ shortest borders. (Received September 11, 2008)