receiver, so we select two subsets, $\Phi_4$ that contains 12 sequences, for which the maximum absolute value of the auto-correlation sidelobes is 4, and $\Phi_8$ that includes 784 sequences, for which the maximum absolute value of the auto-correlation sidelobes is 8. As expected, all the sequences in any set have an average auto-correlation equal to 0.

The cross-correlation function computed between two complementary De Bruijn sequences always shows a negative peak value of $-2^n$, for a shift $\tau = 0$. As a consequence, given the DS-CDMA context of application, it is necessary to avoid the presence of complementary sequences in the set from which spreading codes are chosen. This constraint will limit our analysis to 1024 sequences of span $n = 5$. Table IV describes the statistical properties of the cross-correlation functions computed over 1024 De Bruijn sequences of span 5, that are divided into different subsets by setting different thresholds on the maximum absolute value of the cross-correlation peak. The analysis performed on the cross-correlation properties shows that the two sequences extracted from the half set, for which the cross-correlation absolute peak value is 8, are also the two optimum sequences for auto-correlation. We also observe that in the subset $\Phi_4$, when the threshold on the maximum absolute value of the cross-correlation peak decreases, the statistical figures evaluated increase. It means that if we try to extract sequences having low auto-correlation sidelobes, like those in $\Phi_4$, we can not simultaneously reduce the cross-correlation peak and sidelobes values. If we want a limited cross-correlation peak, we must accept higher sidelobes, and viceversa. As a further remark, we