On non-repetitive complexity of Arnoux-Rauzy words.

Variability of an infinite word $u = u_0u_1u_2 \cdots$ over a finite alphabet can be judged from distinct points of view. For instance, Moothathu introduced in 2012 the non-repetitive complexity $nr_C u$ which reflects the structure of $u$ with respect to the repetitions of factors of a given length. The value $nr_C u(n)$ is the maximal $m$ such that for some $i \in \mathbb{N}$ any factor of $u$ of length $n$ occurs at most once in $u_iu_{i+1}u_{i+2} \cdots u_{i+m+n-2}$. He also considered a prefix variant of this function called the initial non-repetitive complexity function $inr_C u$. In 2016, Nicholson and Rampersad described some general properties of $inr_C u$ and evaluated $inr_C u$ for the Fibonacci and Tribonacci words. Recently, Bugeaud and Kim studied $inr_C u$ for Sturmian sequences. All these words belong to the class of Arnoux-Rauzy words, which are one of the generalizations of Sturmian words to multi-letter alphabets. In this talk, we determine $nr_C u$ for the Arnoux-Rauzy words and $inr_C u$ for the standard Arnoux-Rauzy words. Our main tools are $S$-adic representation of Arnoux-Rauzy words and description of return words to their factors. The formulas we obtain are then used to evaluate $nr_C u$ and $inr_C u$ for the $d$-bonacci word. (Received September 16, 2019)