1070-37-38 **Leonid A Bunimovich** and **Alex Yurchenko***, alex@yurchenko.org. *Non-asymptotic results in the theory of open dynamical systems.*

A natural question of how the survival probability depends upon a position of a hole was seemingly never addressed in the theory of open dynamical systems. We found that this dependency could be very essential. The main results are related to the holes with equal sizes (measure) in the phase space of strongly chaotic maps. Take in each hole a periodic point of minimal period. Then the faster escape occurs through the hole where this minimal period assumes its maximal value. The results are valid for all finite times (starting with the minimal period) which is unusual in dynamical systems theory where typically statements are asymptotic when time tends to infinity. It seems obvious that the bigger the hole is the bigger is the escape through that hole. Our results demonstrate that generally it is not true, and that specific features of the dynamics may play a role comparable to the size of the hole. The main tools that were used to prove these results came from the theory of combinatorics on words. Specifically, we considered counting problems in pattern avoidance in strings and autocorrelation function of strings. (Received December 20, 2010)