## A LOWER BOUND FOR THE MAXIMUM TOPOLOGICAL ENTROPY OF 4k + 2-CYCLES

## LLUÍS ALSEDÀ, DAVID JUHER, AND DEBORAH M. KING

Dedicated to the memory of our friend Pere Mumbrú

ABSTRACT. For continuous interval maps we formulate a conjecture on the shape of the cycles of maximum topological entropy of period 4k + 2. We also present numerical support for the conjecture. This numerical support is of two different kinds. For periods 6, 10, 14 and 18 we are able to compute the maximum entropy cycles by using non-trivial, ad hoc numerical procedures and the results of Jungreis (see [1]). In fact, the conjecture we formulate is based on these results.

For periods n = 22, 26 and 30 we compute the maximum entropy cycle of a restricted subfamily of cycles denoted by  $C_n^*$ . The obtained results agree with the conjectured ones. The conjecture that we can restrict our attention to  $C_n^*$  is motivated theoretically. On the other hand, it is worth noticing that the complexity of examining all cycles in  $C_n^*$  is much less than the complexity of computing the entropy of each cycle of period 18 in order to determine the ones with maximal entropy, therefore making it a feasible problem.

## References

 Irwin Jungreis, Some results on the Šarkovskii partial ordering of permutations, Trans. Amer. Math. Soc. 325 (1991), no. 1, 319–344. MR MR998354 (91h:58060)

Departament de Matemàtiques, Edifici CC, Universitat Autònoma de Barcelona, 08913 Cerdanyola del Vallès, Barcelona, Spain

 $E\text{-}mail \ address: \texttt{alseda@mat.uab.es}$ 

Departament d'Informàtica i Matemàtica Aplicada, Universitat de Girona, Lluís Santaló s/n, 17071 Girona, Spain

 $E\text{-}mail \ address: juher@ima.udg.edu$ 

Departament of Mathematics and Statistics, The University of Melbourne, Vic, 3010, Australia

E-mail address: d.king@ms.unimelb.edu.au

Date: August 29, 2007.

<sup>2000</sup> Mathematics Subject Classification. 37B40, 37E15, 37M99.

Key words and phrases. Combinatorial dynamics, interval map, topological entropy, cycles of maximum entropy.

The first two authors were partially supported by MEC grant number MTM2005-021329.