

# ALTERNATION ACYCLIC TOURNAMENTS

Gábor Hetyei

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## Abstract

We define a tournament to be alternation acyclic if it does not contain a cycle in which descents and ascents alternate. Using a result by Athanasiadis on hyperplane arrangements, we show that these tournaments are counted by the median Genocchi numbers. By establishing a bijection with objects defined by Dumont, we show that alternation acyclic tournaments in which at least one ascent begins at each vertex, except for the largest one, are counted by the Genocchi numbers of the first kind. Unexpected consequences of our results include a pair of ordinary generating function formulas for the Genocchi numbers of both kinds and a new very simple model for the normalized median Genocchi numbers.

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