MSc Sports Performance Analysis - Dissertation

Quantitative Analysis of Sailing Races using GPS data

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Abstract

Quantitative analysis of sailing races in one-design boats using GPS devices can provide an insight to the main factors likely to impact the rank order. These factors include the sailors' skill in steering the boat and trimming the sails but also the route chosen and whether they are already ahead after the start or the 1st leg. GPS position, location, speed and distance data of each boat in 13 elite races, with fleet sizes between 9 and 60, was examined using Spearman and Pearson correlations. It was found that the final rank order correlates significantly ($P < 0.01$) with 1st mark rank order in 84.6% of races in the sample ($n = 13$) and the 1st mark rank order correlates significantly with the rank orders 50% through the 1st leg and 1 minute after the start in most races (53.8% and 66.7% respectively). Results also show that in each race different factors affect the speed and distance travelled of each boat, meaning there is no consistency between races or within races over whether speed or distance is dominant. Finally a method is examined, and partially validated, to extract common themes in a fleet for routes chosen on the 1st leg.

Keywords – sailing, race, performance, quantitative, analysis, GPS