Helios Car: Light and Small Solar Vehicle Developed for a Local Competition

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A scale model solar vehicle was developed for a race held in Medellin in 2015. In this race scale solar vehicles competed, all with the same solar panel and restrictions on dimensions and components. The racetrack had a length of 15m and had four obstacles: roughness (1m), ascent (1m) and descent (1m) with a slope of 30°, and shaded area (1m). From these conditions was posed the question: What are the most crucial variables for obtaining a better performance in this race? Three prototypes were created with modifications made to the following variables: weight, diameter and the width of the tires, the aerodynamic conditions, and the friction exerted by rubbing against the walls of the track. Speed tests were undertaken at different points of the day with different levels of solar radiation. Weight and the friction caused by the walls of the track were identified as the most decisive variables for performance in the race. The weight and the rebound system used to reduce the effect of friction were optimized in the prototype that gave the best performance. This vehicle was used in the race, winning first place among 50 finalist teams from various municipalities of the Department of Antioquia.