



Published on *CD-adapco* (<http://www.cd-adapco.com>)

[Home](#) > Aerodynamics of High-Lift Wings with Ground Effect for Racecars

---

## Aerodynamics of High-Lift Wings with Ground Effect for Racecars

The aerodynamics of a finite-span rectangular wing is investigated using a numerical method. A high-lift single element airfoil section is used. The study focuses on the effect of the ground clearance (the vertical distance between the leading edge of the wing and the ground). The study includes the effect on the overall characteristics of the flow around the wing and the generated aerodynamic forces (down force and drag). Two wings are used in the study with and without end plates. The CFD code ?STAR CCM+? is used in the study. The study showed that there is a range of ground clearance where it has a strong effect on the wing behavior. That effective range was the same for wings with and without end plates. At a small ground clearance, the down force can be easily doubled by small change in the clearance. However, the use of a high lift airfoil section increases the interaction with the ground boundary layer and may cause a decrease in the generated down force.

**Author Name:**

Wael A. Mokhtar

**Industries:**

[Ground Transportation](#) [1]

[Ground Transportation - Sub-Industry](#) [2]

[Automotive](#) [3]

**Products:**

[STAR-CCM+®](#) [4]

**Conference Location:**

Detroit, MI, USA

**Link:**

[Aerodynamics of High-Lift Wings with Ground Effect for Racecars](#) [5]

**Rights:**

2008 SAE International

**Pages:**

10

**Conference Date:**

Monday, April 14, 2008

**Paper Reference:**

2008-01-0656

**Publisher:**

SAE International

**Conference Name:**

SAE World Congress & Exhibition

CD-adapco is the world's largest independent CFD focused provider of engineering simulation software, support and services. We have over 30 years of experience in delivering industrial

strength engineering simulation.

---

**Source URL:** [http://www.cd-adapco.com/conference\\_proceeding/aerodynamics-high-lift-wings-ground-effect-racecars](http://www.cd-adapco.com/conference_proceeding/aerodynamics-high-lift-wings-ground-effect-racecars)

**Links:**

[1] <http://www.cd-adapco.com/industries/ground-transportation>

[2] <http://www.cd-adapco.com/industries/ground-transportation-sub-industry>

[3] <http://www.cd-adapco.com/industries/ground-transportation/%E6%B1%BD%E8%BD%A6>

[4] <http://www.cd-adapco.com/products/star-ccm%C2%AE>

[5] <http://papers.sae.org/2008-01-0656>