

ABSTRACT

This report aims to describe the computational fluid dynamics (CFD) of high speed **Bullet Train**. It also aims to do aerodynamic design optimisation and computation of minimum drag force. In addition of specific features, the implementation of mesh generation and flow calculation investigated. Three dimensional results are discussed, where the shape comparison is done.

PROBLEM STATEMENT

In a first phase, the applicability of the genetic algorithm to aerodynamic optimization has been assessed. For this preliminary feasibility study, simplified configurations were considered:

- the train is restricted to its longitudinal plane of symmetry;
- the rear of the train is included in the calculation, as it plays a significant role on the overall drag.



Figure 1

Target variable to be minimized is the drag coefficient $C_x = \frac{F_x}{1/2\rho SV^2}$

where F_x is the drag force, ρ the air density, S the train cross-sectional area and V its speed.