**Introduction**

This small projects aims to demonstrate how elevation and air temperature, essentially air density, affects the engine power output. As a motorsport engineer, I wanted to show this for F1 vehicles where elevation varies from -28m to 2240m and air temperature from 17 OC tup to 42 OC. As an additional bonus I wanted to provide what kind of change we can expect from 2026 cars with the new regulations compared to the current cars.

This analysis also includes the use of 100% sustainable fuels as they are going to be introduced in 2026. Fuel assumed is ethanol in this case.

**Assumptions and Values**

Values for the calculations are obtained from FIA regulations, my own validated F1 powertrain model from my SAE publication and also from city legends like 50% ηbte. Details of these can be found in the MATLAB code which is attached to the report.

Main assumption in this study is that air enters the chamber at Mach 1 which would be the maximum flow condition. Combustion is also assumed complete with no cyclic variations.