At a given location, the average wind velocity, $V_m(z)$, at height z is calculated from the following equation :

$$V_m(z) = C_e(z) \cdot C_t \cdot V_b \tag{3.2}$$

where

$V_m(z)$: Average wind velocity at height z.

V_b : Basic wind speed.

$C_e(z)$: Effect of surface roughness at height z.

C_t : Effect of surface topography.

3.1.1. Structure of wind in Dubai

The structure of wind in Dubai is controlled by three different wind phenomena: synoptic winds, Shamal winds, and thunderstorms. The vertical profile of synoptic wind velocities can be modelled by using the standard logarithmic profile model, where the velocity increases monotonically with height and reaches its maximum at the top of the building. Shamal winds, which are the result of desert environment and climate in the region, reach their peak velocity around 200 *m*. The velocity becomes smaller as the altitude gets higher. The thunderstorms typically have their peak velocities around the height of 50 m. The recorded synoptic wind speeds at 10m height are less than those recorded at the same height during thunderstorm events.

Although there are several important studies done on the structure of wind in Dubai, further research is needed to quantify the profiles of Shamal winds and thunderstorms, so that they can be incorporated in design codes.

Studies have shown that for extreme cases the synoptic winds still control the design.
Also, the comparison of velocity profiles in several codes does not suggest any major flaw in extending the log law beyond 200*m* , which is the limit in Eurocode, in light of many other more pressing uncertainties that surface in the quantification of wind velocity profiles.