

Figures annex

RANS

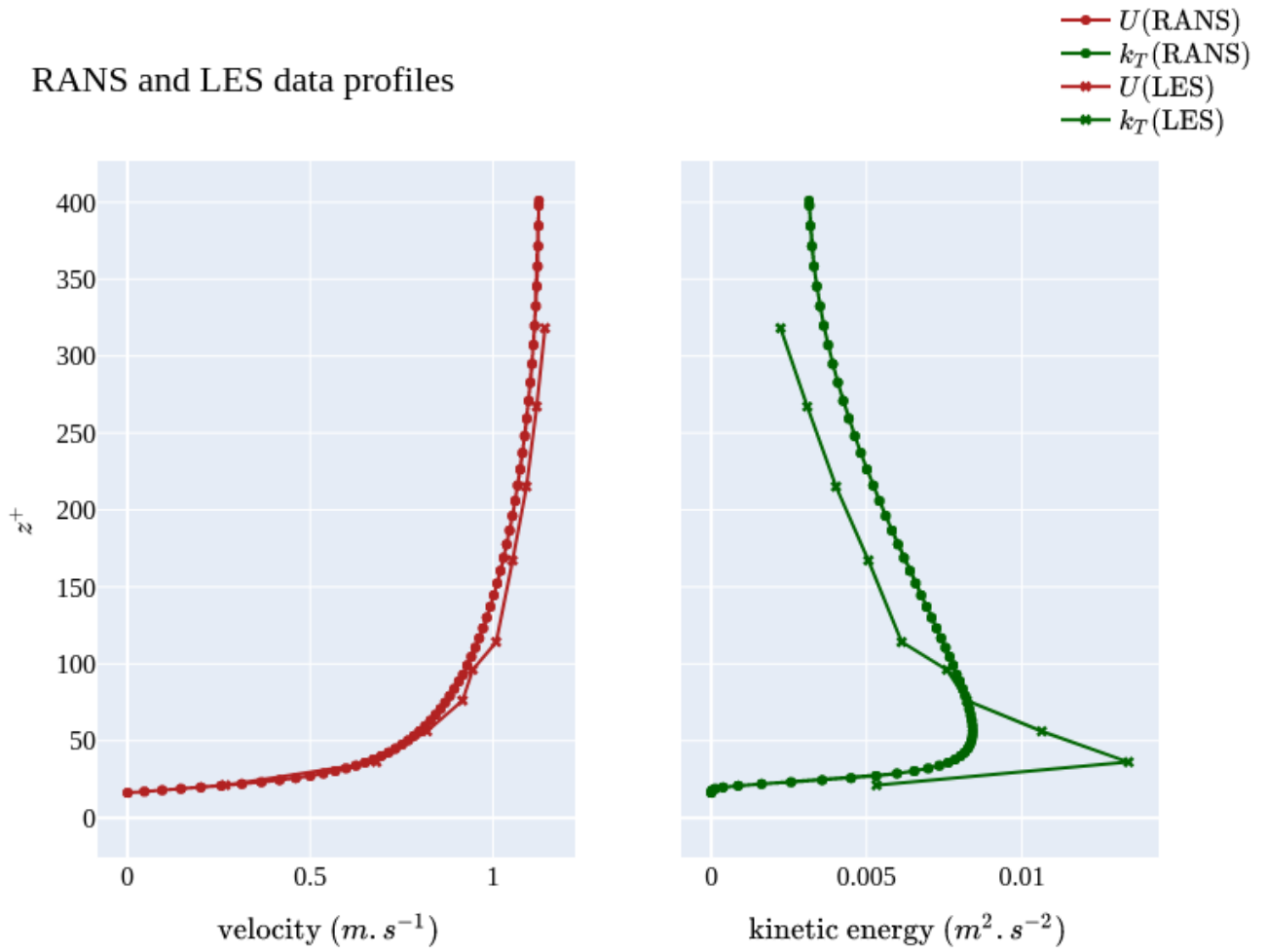


Figure 1: The two velocity profiles of streamwise velocity (left) and spanwise velocity (middle) and the kinetic energy profile (right). They are plotted in function of z^+ . It seems that we have two outlier points. The last point and one between $z^+ = 50$ and $z^+ = 100$

Velocity analyses

Mean velocity ratio profile

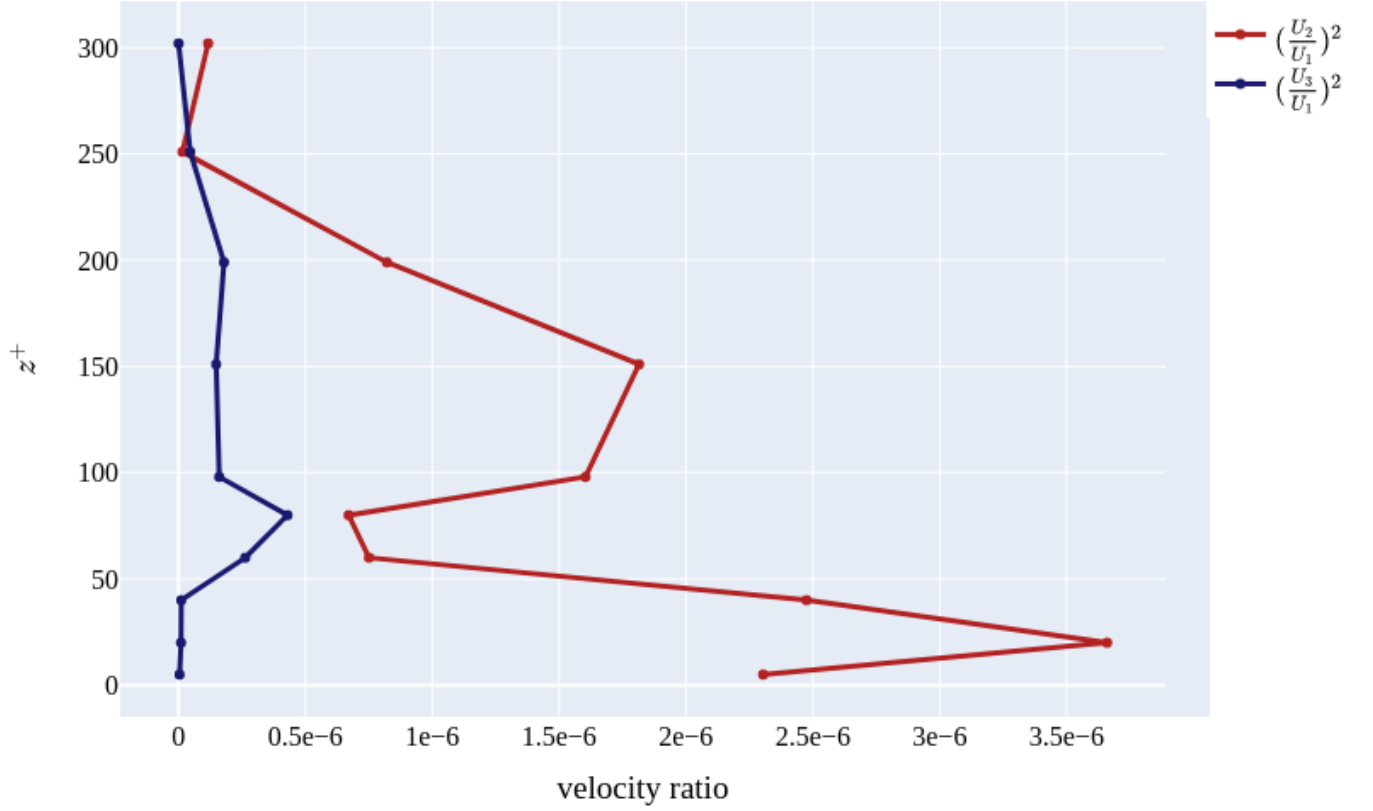


Figure 2: Square ratio of the spanwise on streamwise velocity (red) and the wall-normal on streamwise velocity (blue). They have been calculated taking the 10 streamwise plans. The streamwise velocity appears to be very dominant on both the spanwise and the wall-normal velocity.

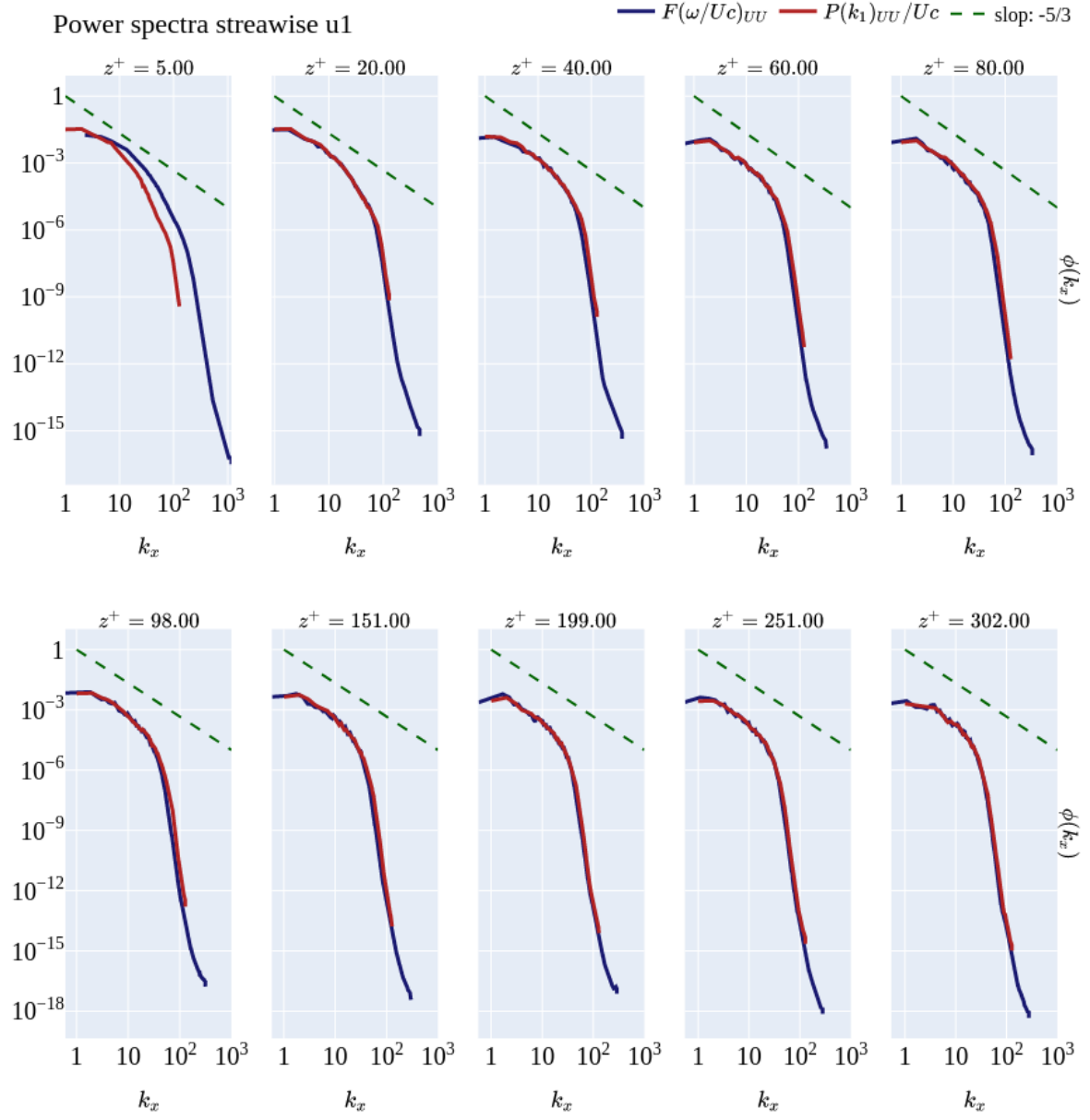
Frozen turbulence

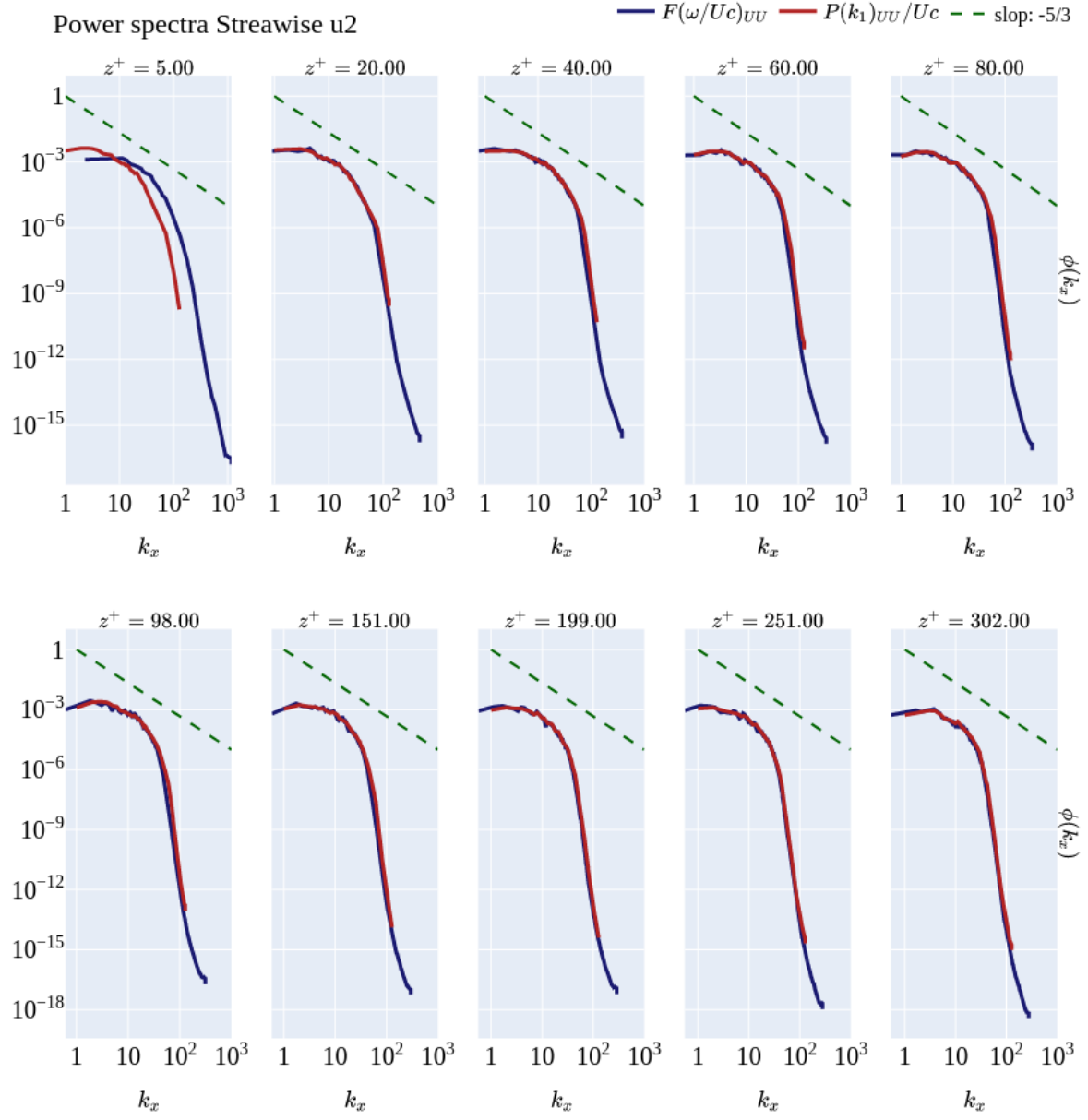
We want to verify the frozen turbulence hypothesis which states that $\phi_{ij}^{[1]}(k_1, x_2, x_3) = U_c \psi_{ij}(U_c k_1, x_2, x_3)$ with $\omega = U_c k_1$. U_c is the mean streamwise velocity, $\phi_{ij}^{[1]}$ is the spatial spectra in the streamwise direction and ψ_{ij} is the time spectra.

Power spectras

Spatial correlations

Gamma coefficient determination





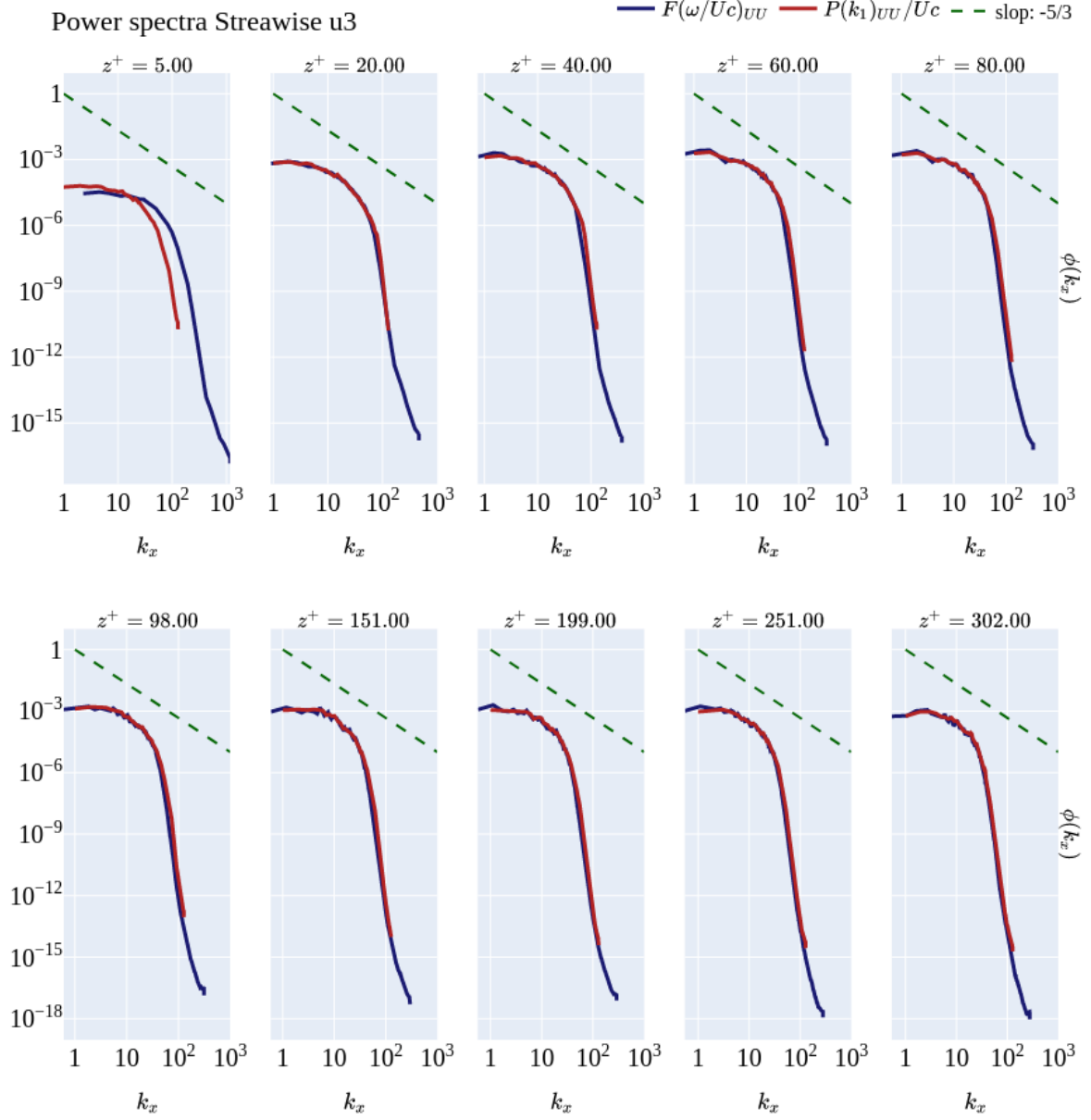
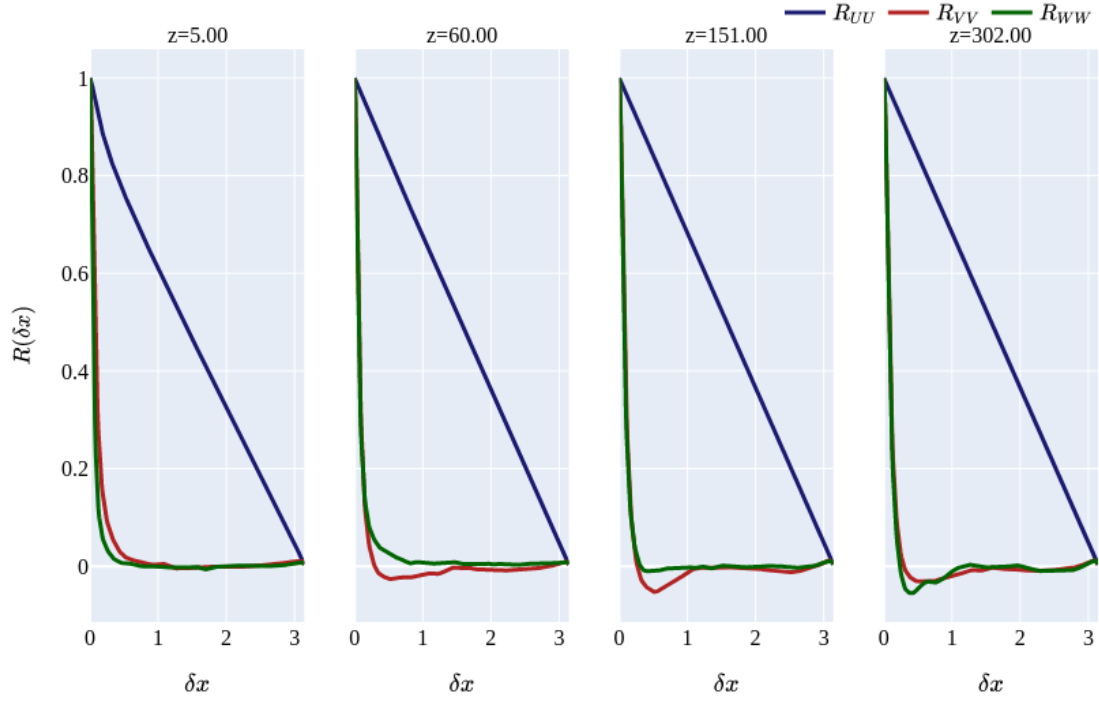


Figure 3: Power spectra in space (red) and time (blue) for the streamwise velocity (top), spanwise velocity (middle) and wall-normal velocity (bottom) at 10 different heights. The Uc took is the mean velocity along the streamwise axis

Space Correlation Streamwise



Space Correlation Streamwise

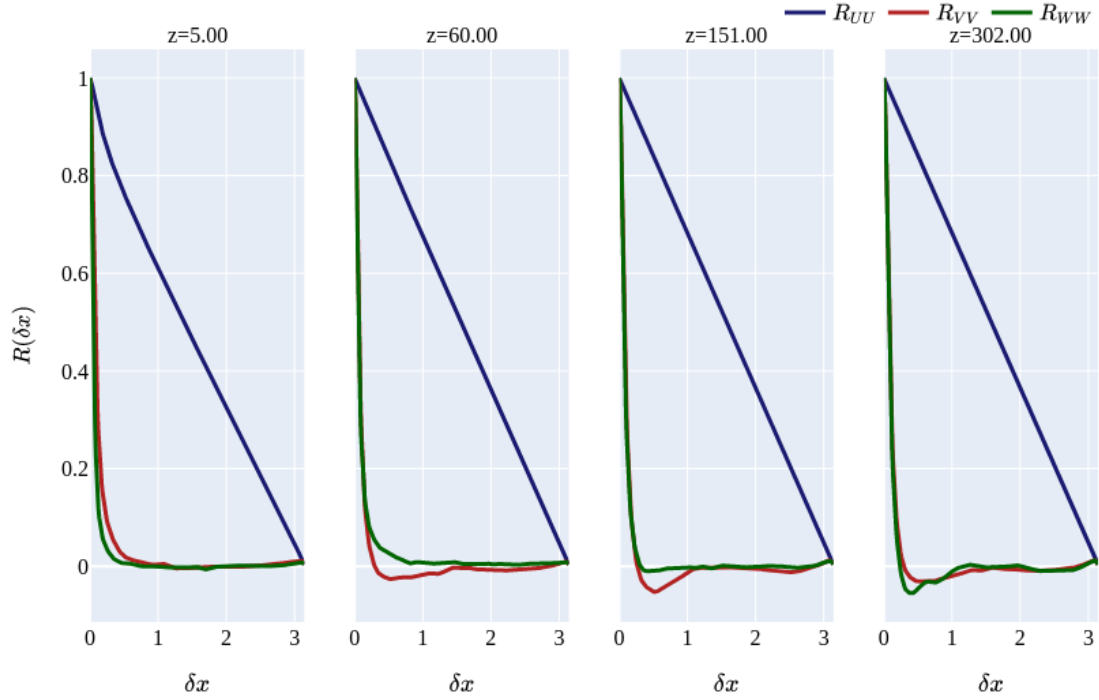
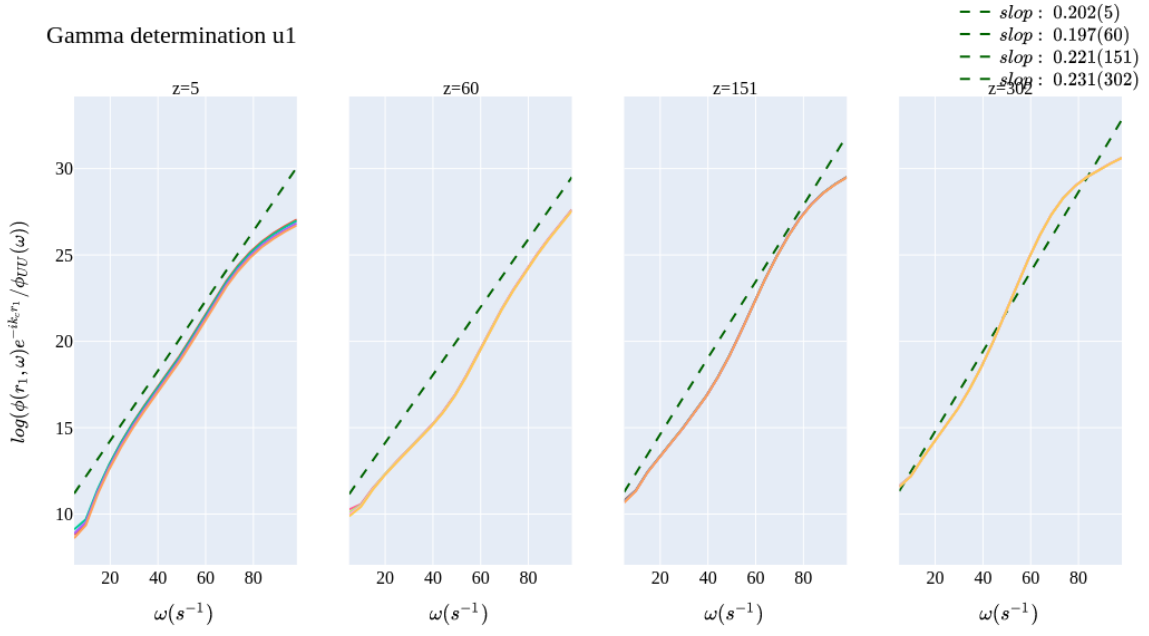
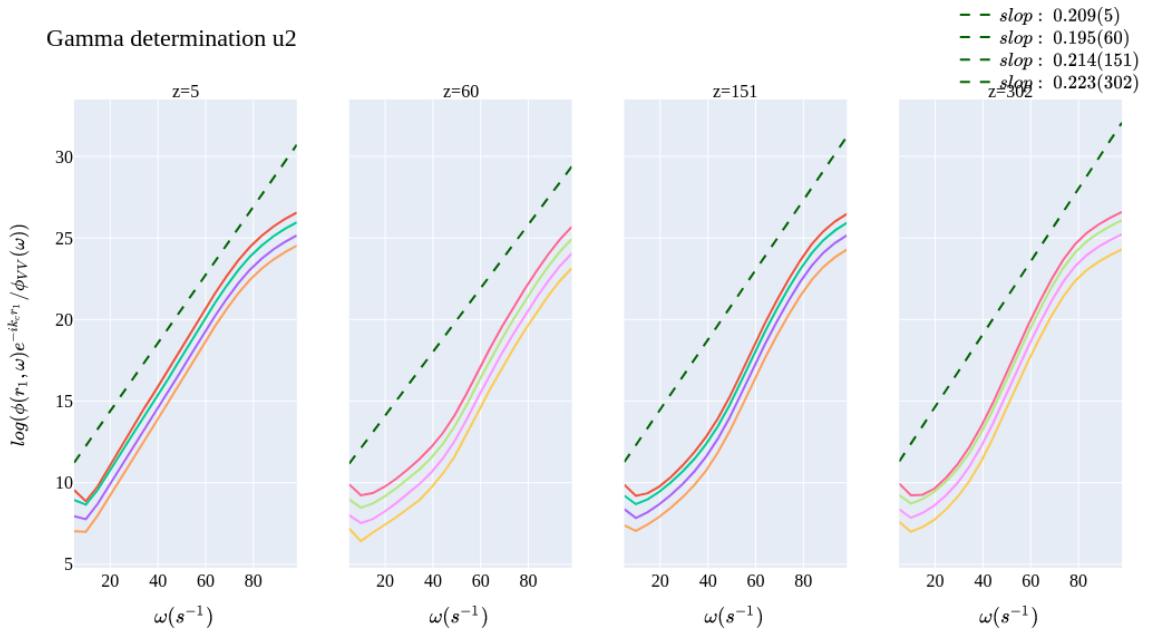


Figure 4: Spatial correlation in a streamwise plan (top figure) and in a spanwise plan (bottom figure). U is the streamwise, V the spanwise and W the wall-normal velocities

Gamma determination u1



Gamma determination u2



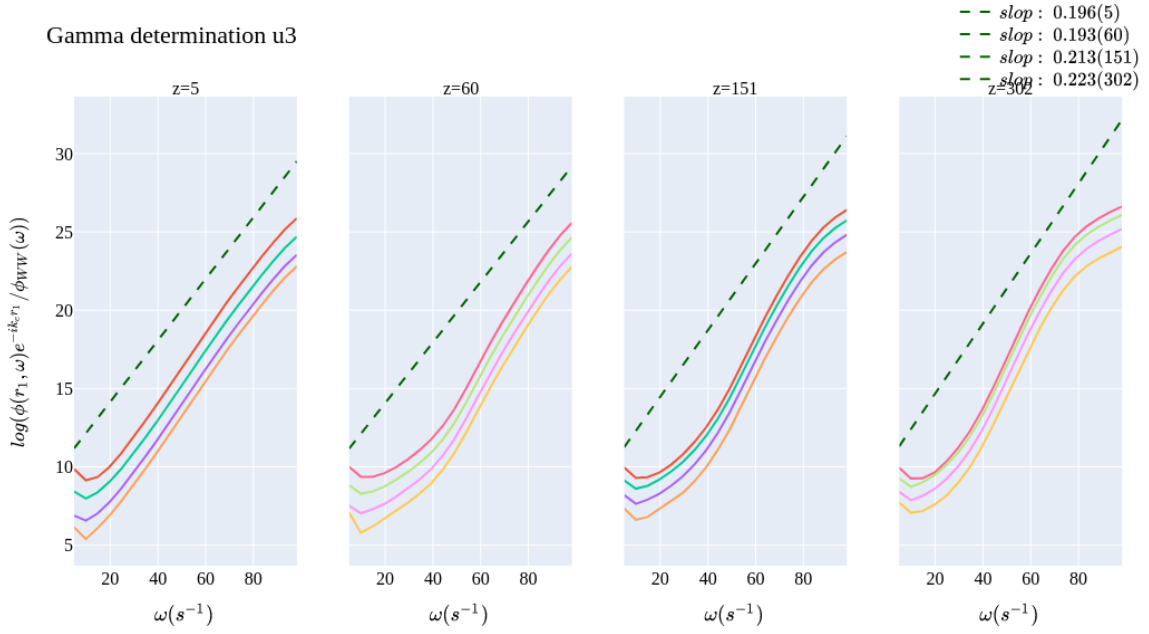


Figure 5: Determination of γ coefficient as $e^{-\gamma k_c r_1} = \frac{\phi(r_1, \omega)}{\phi_{ii}(\omega)} e^{-ik_c r_1}$. All these spectra are computed with streamwise plan with streamwise velocity (top figure), spanwise velocity (middle figure) and wall-normal velocity (bottom figure)