

TP-08_SLOPE_STRATIFIED :

Gravity currents over a *tanh* shaped topography

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To Do List (refer to Tanh_Slope.pdf)

1. The velocity data are in the coordinate system horizontal/vertical (x,y) . Transform the velocity fields in the coordinate system which is parallel and orthogonal to the bottom topography (x',y') .
2. Calculate the averaged velocity $(\langle u \rangle, \langle v \rangle)$ and the Reynolds stresses $(\langle u' u' \rangle, \langle u' v' \rangle)$ fields.
3. Calculate the depth integrated velocity and plot it as a function of x' . Compare it with the maximum velocity.
4. Calculate the entrainment using the relation for E_q and E_w and plot it as a function of x' . Discuss the results.
5. Calculate the PDFs of the Reynolds stresses $u'v'$ at different distances from the bottom. What can you conclude from the PDF?
6. Estimate the mixing lengths L_m and the turbulent diffusivity $\nu_t (=K_m)$.
7. Calculate the turbulent dissipation using the equations (5,6,7).
8. Estimate the shear scale L_s , the Ozmidov scale L_o (see equation 4) and plot them as a function of L_m .
9. Plot the turbulent diffusivity $\nu_t (=K_m)$ as a function of L_s (using an appropriate normalization).

References

1. Tanh_Slope.pdf
2. MNH19.pdf