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The study of wind driven surface gravity waves is one of the oldest and challenging topics in fluid flow. The precise nature of the transfer of momentum from wind to water involves a complicated interaction between the driving wind and viscous vortical flow of wind and water.

In this talk I will present a simple model for this interaction leading to an exact solution for the base flow. We then perturb the base flow and study the associated linear stability problem. Unlike the traditional approach, the base flow is time dependent and hence the linearised equations do not lead to a simple eigenvalue problem. Instead the equations will be analysed using the Uniform Transform Method (UTM). Recent work by Sheils and Deconinck has extended UTM to consider interface problems of which the present model is an example. In particular, the talk will present results on UTM applied a fourth order, mixed partial derivative equation. The ultimate goal is to derive an estimate of the fastest growing horizontal mode for the given base flow. (Received September 19, 2015)