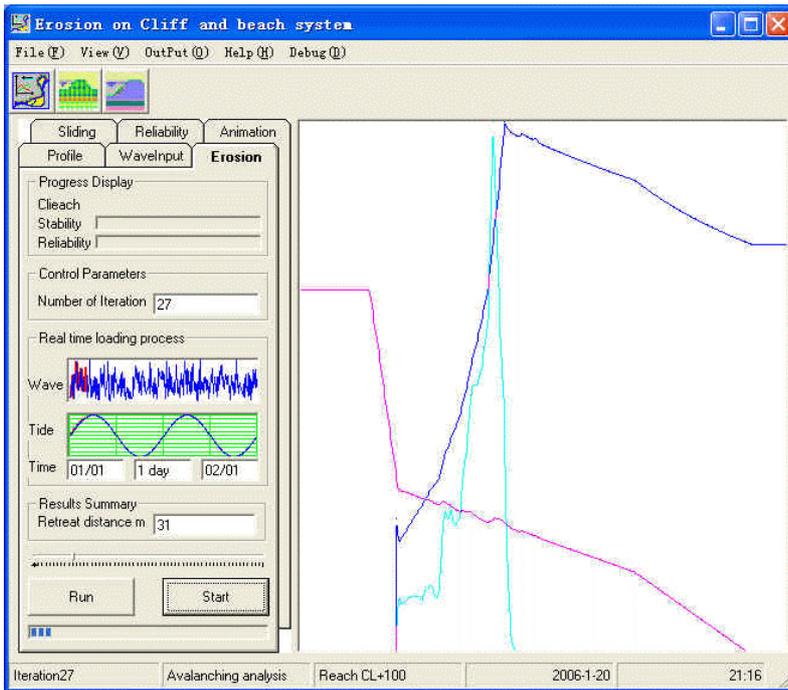


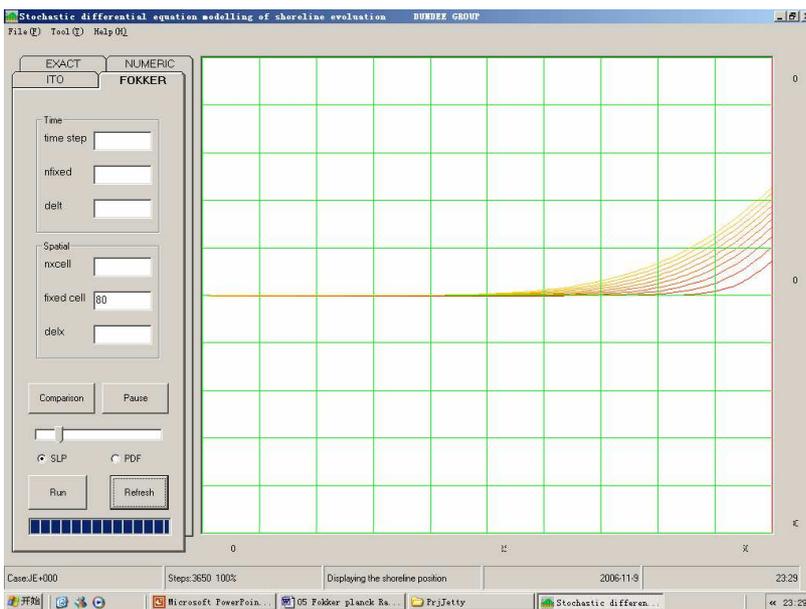
Software system on Cross-shore and Long-shore erosion prediction



Process of simulation of cliff beach system

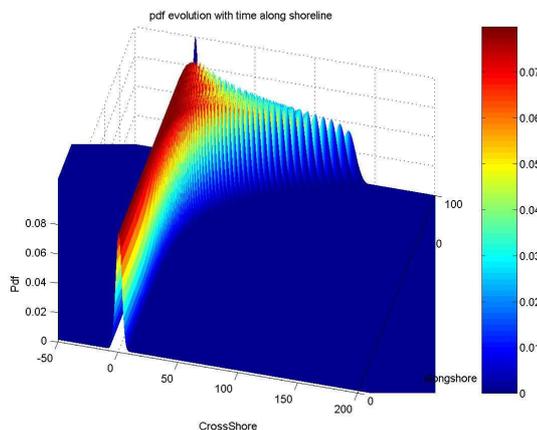
For each time-step wave transformation and breaking as waves approach the shore; cross shore sediment transport on the beach; the littoral drift and run-up on the shore platform or beach is calculated. A slope stability calculation is carried out to establish whether the removal of material at the cliff toe or the groundwater conditions at that time-step have destabilized the cliff sufficiently to cause a landslide event. If a landslide does take place the cliff geometry is then updated and a volume of sliced block is added onto the beach according to the mass movement.

Subsequently, the cumulative cliff retreat due to catastrophic collapse and the new notch depth were updated, and more gradual erosion on the beach was calculated, starting the whole process over again.



Probabilistic solution of shoreline evolution

Computing the shoreline position by process-based one line model, then calculate the breaking angle and long-shore transport rate. Predicting the transfer function, and solving the Fokker-Planck model (Parabolic type) or Liouville model (Hyperbolic type) to obtain Probability Density Function of shoreline position. Integrating mean value of the shoreline position for using in next time step



Time varying process of the Probability Density Function of shoreline position can be display in 3D form