Numerical investigation of wind over two progressive waves TAO CAO, University of Minnesota — Wind-wave interaction is important in many applications and critical for the fundamental understanding of the wind-wave growth mechanism. It has been found in present study that the growth of short wave is suppressed in the presence of long waves, which is called the sheltering effect. In the present study, we have carried out a direct numerical simulation (DNS) of wind over two surface waves to improve the understanding of the sheltering effect. We have observed that the sheltering effect on the short wave strongly depends on the wave age of the long wave, thus the wave growth rate of the long wave. For the slow and fast long waves, the magnitude of wave growth rate of the short wave is significantly reduced compared with the cases with short wave only. But for the intermediate long wave, this reduction is relatively small. Based on the DNS data, the budget of energy conservation in the wave boundary layer is analyzed in detail.