Analysis of the Effect of Hump on the Stability of Boundary Layer by using Parabolized Stability Equations BING GAO, SEUNG O. PARK, Korea Advanced Institute of Science and Technology — A linear PSE is applied to stability analysis of incompressible boundary layer flow over a hump. A spatial relaxed technique is introduced to overcome the marching difficulty as the marching step is required to be rather small to catch the effect of surface roughness on the stability of T-S waves. Results shows that the streamwise velocity profiles of disturbances exhibit the third peak inside the boundary layer as the profiles of mean flow have an inflection point. The third peak can retain a rather long distance after reattachment point. There exists a resonance effect which makes instability waves more unstable when the wavelength of disturbances is comparable to the width of hump. The critical layer plays an important role in deciding whether the hump has a large effect on the stability of T-S waves. Keywords: spatial relaxed, parabolized stability equations, hump, stability analysis, resonance effect, critical layer.

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