disturbance conditions. Figure 12 shows the comparison of regulation of roll angle using BS and ABS with $C_1 = C_2 = 1$. Figure 13 shows the comparison of regulation of roll rate using BS and ABS with $C_1 = C_2 = 1$. Figure 14 shows the comparison of tracking of roll angle using all the two controllers with $C_1 = C_2 = 1$. Figure 15 shows the disturbance analysis of the two controllers when they are subjected to a disturbance of 20 degree. From the simulation results, it is clear that the Adaptive Backstepping Controller gives a better response than Backstepping Controller.

6. Conclusion

In this paper Backstepping and Adaptive Backstepping Control schemes has been designed for the roll channel of launch vehicle in order to control the roll angle and the roll rate of launch vehicle. In the Backstepping control design all the non linearities affecting the system were considered as constant where as in Adaptive Backstepping design uncertainties associated with the system is considered while designing the control law and the parameter adaptation law. Simulation results shows that Adaptive Backstepping Control design gives comparatively better and satisfactory responses in comparison with the Backstepping Control design. Thus Adaptive Backstepping Controller displays good adaptability.

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