















Fig. 13 Responses of AACC  
 $(x^T(0) = [0, 1.306, 0])$

Figs. 5, 6 and 7 show the responses in the case of  $x^T(0) = [0, 1.2, 0]$ . Figs. 8, 9 and 10 show the responses in the case of  $x^T(0) = [0, 1.303, 0]$ . Figs. 11, 12 and 13 show the responses in the case of  $x^T(0) = [0, 1.306, 0]$ . These results indicate that the stable region of the new AACC is better than the AACC(Hamil), the AACC(Lyap) and the LOC.

## 5 Conclusions

We have studied an augmented automatic choosing control designed by extremizing a combination of the Hamiltonian and Lyapunov functions using the gradient optimization automatic choosing functions for nonlinear systems. This approach was applied to a field excitation control problem of power system to demonstrate the usefulness of the AACC. Simulation results have shown that this controller could improve the performance remarkably.

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