

Abstract—In acoustic echo cancellation (AEC) applications, where the acoustic echo paths are extremely long, the adaptive filter works most likely in an under-modeling situation. Most of the adaptive algorithms for AEC were derived assuming an exact modeling scenario, so that they do not take into account the under-modeling noise. In this letter, a variable step-size normalized least-mean-square (VSS-NLMS) algorithm suitable for the under-modeling case is proposed. This algorithm does not require any *a priori* information about the acoustic environment; as a result, it is very robust and easy to control in practice. The simulation results indicate the good performance of the proposed algorithm.