

# Adjusted Parameter Scheme for Soft Handoff in CDMA Cellular System

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## Abstract

In this paper, we investigate how an adjusted soft handoff parameter effects on the system performance of the code division multiple access(CDMA) cellular system.

There are three major parameters for CDMA soft handoff( $T_{ADD}$ ,  $T_{DROP}$ ,  $T_{TDROP}$ ). The soft handoff process is initiated when the power received by the mobile station(MS) from the BSs of neighbor cells exceeds  $T_{ADD}$  threshold. If the power received by the MS from the BS of the current cell is below of  $T_{DROP}$  threshold, the MS starts the handoff drop timer. The connection between the MS and the current BS is broken if the power is below of  $T_{DROP}$  threshold continuously during  $T_{TDROP}$  and the drop timer is expired. In the conventional CDMA system these parameters are predetermined.

If due to the no availability of free channels in neighbor cells the MS has not been assigned another channel until the MS loses the current channel, the call is terminated involuntarily. In this paper, we suggest a scheme of adjusting soft handoff parameters, especially  $T_{TDROP}$ , to decrease the forced termination probability.

In this scheme, we suggest to adjust  $T_{TDROP}$  for each MS which has varying speed and moving direction.  $T_{TDROP}$  is determined based on the predicted forced termination time. The MS calculates its predicted forced termination time by using the change rate of the received pilot strength from the serving BS and using the current time broadcast by the *sync* channel of the serving BS as a reference time. If an MS  $i$  has a higher speed than MS  $j$ , the predicted forced termination time of MS  $i$  is shorter than that of MS  $j$ . Therefore, we assign a larger value of  $T_{TDROP}$  to a fast MS, and a smaller value of  $T_{TDROP}$  to a slow MS.

The performance of the proposed scheme is compared with that of the conventional CDMA soft handoff scheme by computer simulation.