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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>** |
| Title | **Proposal for Fast Timing Synchronization in OFDMA** |
| Date Submitted | ***2004-06-07*** |
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| Re: | *This is a response to a Call for Comments IEEE802.16e-04/xx on IEEE P802.16e-D2* |
| Abstract | *Suggestion for Fast Timing Synchronization in OFDMA* |
| Purpose | This document is submitted for review by 802.16e Working Group members |
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# Proposal for Fast Timing Synchronization in OFDMA

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## 1. Introduction

In order to perform a handover, an MSS shall scan a Neighbor BS to obtain its synchronization and CINR. For adopting OFDMA specified in the current 802.16 standard, an MSS can synchronize by using preamble allocated to a single symbol in each frame. The acquisition of preamble is a very essential and important process because the flow of most signals between BS and SS starts after timing synchronization.

However, since MSS has only a single chance in each frame to acquire a preamble, timing synchronization can be done in terms of frames; i.e., it may take several frames for an MSS to get timing synchronization based on preambles. If the MSS miss a preamble, it should wait for the next frame. Additionally, if there are several BSs that an MSS needs to synchronize with, it should repeat the procedures for synchronization per each BS, which makes the MSS waste power and degrades communication quality due to delay during a handover to neighbor BS.

Therefore, we propose new and simple reference signals to reduce the time required for synchronization. Also, the proposed signals do not affect the existing structure of OFDMA system specified in IEEE 802.16 standard.