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Suh et al.

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(54) **APPARATUS AND METHOD FOR CHANNEL ESTIMATION IN AN ORTHOGONAL FREQUENCY DIVISION MULTIPLEXING CELLULAR COMMUNICATION SYSTEM USING MULTIPLE TRANSMIT ANTENNAS**

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(57) **ABSTRACT**

(65) **Prior Publication Data**

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An apparatus and method for channel estimation using preamble signals received from a serving Node B and neighboring Node Bs each having N (≥ 1) transmit antennas in a UE having M (≥ 1) receive antennas in a broadband wireless communication system. In the channel estimation apparatus, a Node B number decider calculates the maximum number N_s of channel-estimatable Node Bs using a preamble length, the number of antennas in each of the Node Bs, and the number of multiple paths. A multi-cell preamble matrix generator generates a multi-cell preamble matrix x_s by generating a Node B preamble matrix for each of the Node Bs and selecting N_s Node B preamble matrices according to reception power among the Node B preamble matrices. A channel estimator performs a channel estimation using x_s and signals received through the M antennas during a preamble receiving period.

(30) **Foreign Application Priority Data**

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455/63.1; 455/278.1

(58) **Field of Classification Search** 375/130,
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455/403, 422.1, 436, 443, 130, 269, 280-284
See application file for complete search history.

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20 Claims, 20 Drawing Sheets

