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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

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<input type="checkbox"/> Additional inventors are being named on the _____ separately numbered sheets attached hereto					
TITLE OF THE INVENTION (280 characters max)					
COMMUNICATION SIGNAL PROCESSING METHODS AND SYSTEMS					
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ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/> Specification Number of Pages <input type="text" value="50"/>		<input type="checkbox"/> CD(s), Number <input type="text"/>		<input type="checkbox"/> Other (specify) <input type="text"/>	
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60/581356

062204

Respectfully submitted,

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06/22/04

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COMMUNICATION SIGNAL PROCESSING METHODS AND SYSTEMS

Field of the Invention

This invention relates generally to communications and, in particular, to processing communication signals.

5 Background

Known solutions to resolve MIMO feedback channels are very complicated.

Conventional communication systems also provide limited if any macro-diversity.

10 Summary of the Invention

A method of signal processing is provided in one aspect, and comprises determining respective weights, for each of a plurality of signals to be concurrently transmitted, based on feedback information from at least one
15 receiver to which the plurality of signals is to be transmitted, and applying the determined signal weights to the plurality of signals.

In some embodiments, the feedback information comprises the respective weights.

20 In some embodiments, each respective weight comprises a real or complex coefficient of one or more elements having one or more bits.

In some embodiments, the plurality of signals comprises respective sets of signals intended for a
25 plurality of receivers including the at least one receiver, and wherein the feedback information comprises feedback

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information from each of the plurality of receivers for the set of signals intended for the receiver.

In some embodiments, the method includes outputting the weighted signals for transmission from
5 respective antennas.

In some embodiments, the weights allow per antenna power allocation and balancing, SINR optimization from the receiver, and/or joint transmit-receive closed loop optimization as Weiner solution.

10 In some embodiments, determining comprises determining a respective set of weights for each of the plurality of signals, the set of weights for each of the plurality of signals comprising respective weights
15 associated with a plurality of antennas, and wherein applying comprises applying to each of the plurality of signals the corresponding set of weights to generate a plurality of weighted signals, and the method further includes combining weighted signals generated using weights
20 respectively corresponding to each of the plurality of antennas to generate a combined weighted signal for each of the plurality of antennas, and outputting the combined weighted signals for transmission from the plurality of antennas.

In some embodiments, the antennas comprise a
25 subset of antennas provided at a transmitter.

In some embodiments, the feedback information further comprises one or more of selection information for selecting the subset of antennas or muting information for muting others than the subset of antennas.

In some embodiments, each of the selection information and the muting information comprises an antenna group index of one or more bits.

5 In some embodiments, the respective weights comprise weights associated with a plurality of antennas, and wherein applying comprises applying to each of the plurality of signals the weight corresponding to the antenna from which the signal is to be transmitted to generate a weighted signal for transmission from the antenna.

10 In some embodiments, the method further comprises processing either or both of the weight and signal used to generate the weighted signal for transmission from each antenna, and generating a processed weighted signal for subsequent transmission from each antenna using the
15 processed weight and/or signal.

In some embodiments, the plurality of signals comprise signals associated with a plurality of users or layers in a communication system.

In some embodiments, the communication system
20 comprises a MIMO system.

In some embodiments, the antennas comprise antennas from different network elements in a communication system.

In some embodiments, the different network
25 elements are in an active set of network elements for a communication device operating in the communication system.

In some embodiments, the at least one receiver provides the feedback information to each of the different network elements.

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