CLAIMS

1. A method for choosing downlink codes for femto nodes in a wireless communication environment, comprising:

receiving downlink transmissions from at least one of one or more neighboring femto nodes and one or more macrocell base stations;

evaluating the downlink transmissions to recognize a first set of detected downlink codes that each have a pilot energy above a detection threshold;

determining a second set of downlink codes reserved for the femto nodes; and

selecting an optimal downlink code from the second set of downlink codes for use in connection with serving user equipment responsive to a correlation between the first set of detected downlink codes and the second set of downlink codes.

2. The method of claim 1, wherein a subset of the first set of detected downlink codes is included in the second set of downlink codes and a remainder of the first set of detected downlink codes is included in a third set of downlink codes associated with macrocells.

3. The method of claim 1, wherein the detection threshold is one of a preset threshold or an adaptively determined threshold.

4. The method of claim 1, further comprising selecting the optimal downlink code autonomously as part of self calibration.

5. The method of claim 1, wherein selecting the optimal downlink code further comprises selecting a downlink code with a smallest amount of detected energy when the correlation indicates that all the downlink codes of the second set of downlink codes are included in the first set of detected downlink codes.

6. The method of claim 1, wherein selecting the optimal downlink code further comprises randomly selecting a downlink code from the second set of downlink codes that are not members of the first set of detected downlink codes when the correlation indicates that one or more members of the second set of downlink codes are not members of the first set of detected downlink codes.

7. The method of claim 1, wherein the acts of receiving downlink transmissions, evaluating the downlink transmissions, and selecting the optimal downlink code are periodically repeated.

8. A wireless communications apparatus, comprising:

a downlink receiver for receiving downlink transmissions from at least one of one or more neighboring femto nodes and one or more macrocell base stations;

a code detector for recognizing a first set of detected downlink codes that each have a pilot energy above a detection threshold by evaluating the downlink transmissions; and

a code selector for selecting an optimal downlink code for use in connection with serving user equipment based upon the first set of detected downlink codes wherein the optimal downlink code is from a second set of downlink codes reserved for femto nodes.

9. The apparatus of claim 8, wherein a subset of the first set of detected downlink codes is included in the second set of downlink codes and a remainder of the first set of detected downlink codes is included in a third set of downlink codes associated with macrocells.

10. The apparatus of claim 8, wherein the detection threshold is one of a preset threshold or an adaptively determined threshold.

11. The apparatus of claim 8, wherein the code selector is further for selecting the optimal downlink code autonomously as part of a self calibration.

12. The apparatus of claim 8, wherein the code selector is further for selecting a downlink code with a smallest amount of detected energy as the optimal downlink code when all of the second set of downlink codes are included in the first set of detected downlink codes.

13. The apparatus of claim 8, wherein the code selector is further for randomly selecting a downlink code from one or more downlink codes of the second set of

downlink codes that are not members of the first set of detected downlink codes as the optimal downlink code.

14. A wireless communications apparatus, comprising:

means for receiving downlink transmissions from at least one of one or more neighboring femto nodes and one or more macrocell base stations;

means for recognizing a first set of detected downlink codes that each have a pilot energy above a detection threshold by evaluating the downlink transmissions; and

means for selecting an optimal downlink code for use in connection with serving user equipment based upon the first set of detected downlink codes, the optimal downlink code being from a second set of downlink codes reserved for femto nodes.

15. The apparatus of claim 14, wherein a subset of the first set of detected downlink codes is included in the second set of downlink codes and a remainder of the first set of detected downlink codes is included in a third set of downlink codes associated with macrocells.

16. The apparatus of claim 14, wherein the detection threshold is one of a preset threshold or an adaptively determined threshold.

17. The apparatus of claim 14, further comprising means for selecting the optimal downlink code autonomously as part of self calibration.

18. The apparatus of claim 14, wherein the means for selecting the optimal downlink code further comprises means for selecting a downlink code with a smallest amount of detected energy when all the downlink codes of the second set of downlink codes are included in the first set of detected downlink codes.

19. The apparatus of claim 14, wherein the means for selecting the optimal downlink code further comprises means for randomly selecting a downlink code from one or more downlink codes of the second set of downlink codes that are not members of the first set of detected downlink codes.

20. A computer program product, comprising:

computer-readable medium comprising codes for causing a computer to:

receive downlink transmissions from at least one of one or more neighboring Home femto nodes and one or more macrocell base stations;

evaluate the downlink transmissions to recognize a first set of detected downlink codes that each have a pilot energy above a detection threshold; and

select an optimal downlink code for use in connection with serving user equipment based upon the first set of detected downlink codes, the optimal downlink code being from a second set of downlink codes reserved for femto nodes.

21. The computer program product of claim 20, wherein a subset of the first set of detected downlink codes is included in the second set of downlink codes and a remainder of the first set of detected downlink codes is included in a third set of downlink codes associated with macrocells.

22. The computer program product of claim 20, wherein the computer-readable medium further comprises codes for causing the computer to select a downlink code with a smallest amount of detected energy as the optimal downlink code when all of the second set of downlink codes are included in the first set of detected downlink codes.

23. The computer program product of claim 20, wherein the computer-readable medium further comprises codes for causing the computer to randomly select a downlink code from one or more downlink codes of the second set of downlink codes that are not members of the first set of detected downlink codes as the optimal downlink code.

24. In a wireless communications system, an apparatus comprising:

a memory; and

a processor operably coupled to the memory and configured for:

receiving downlink transmissions from at least one of one or more neighboring femto nodes and one or more macrocell base stations;

evaluating the downlink transmissions to recognize a first set of detected downlink codes that each have a pilot energy above a detection threshold; and

selecting an optimal downlink code for use in connection with serving user equipment based upon the first set of detected downlink codes, the optimal downlink code being from a second set of downlink codes reserved for femto nodes.

25. The apparatus of claim 24, wherein a subset of the first set of detected downlink codes is included in the second set of downlink codes and a remainder of the first set of detected downlink codes is included in a third set of downlink codes associated with macrocells.

26. The apparatus of claim 24, wherein selecting the optimal downlink code further comprises selecting a downlink code with a smallest amount of detected energy when all the downlink codes of the second set of downlink codes are included in the first set of detected downlink codes.

27. The method of claim 24, wherein selecting the optimal downlink code further comprises randomly selecting a downlink code from one or more downlink codes of the second set of downlink codes that are not members of the first set of detected downlink codes.

CLAIMS

1. A method for choosing downlink codes for femto nodes in a wireless communication environment, comprising:

receiving downlink transmissions from at least one of one or more neighboring femto nodes and one or more macrocell base stations;

evaluating the downlink transmissions to recognize a first set of detected downlink codes that each have a pilot energy above a detection threshold;

determining a second set of downlink codes reserved for the femto nodes; and

selecting an optimal downlink code from the second set of downlink codes for a femto node to use in connection with serving user equipment responsive to a correlation between the first set of detected downlink codes and the second set of downlink codes, wherein selecting the optimal downlink code comprises selecting a downlink code with a smallest amount of detected energy when the correlation indicates that all the downlink codes of the second set of downlink codes are included in the first set of detected downlink codes.

2. The method of claim **1**, wherein a subset of the first set of detected downlink codes is included in the second set of downlink codes and a remainder of the first set of detected downlink codes is included in a third set of downlink codes associated with macrocells.

3. The method of claim 1, wherein the detection threshold is one of a preset threshold or an adaptively determined threshold.

4. The method of claim 1, further comprising selecting the optimal downlink code autonomously as part of self calibration.

5. The method of claim 1, wherein selecting the optimal downlink code further comprises randomly selecting a downlink code from the second set of downlink codes that are not members of the first set of detected downlink codes when the correlation indicates that one or more members of the second set of downlink codes are not members of the first set of detected downlink codes.

6. The method of claim 1, wherein the acts of receiving downlink transmissions, evaluating the downlink transmissions, and selecting the optimal downlink code are periodically repeated.

7. A wireless communications apparatus, comprising:

a downlink receiver for receiving downlink transmissions from at least one of one or more neighboring femto nodes and one or more macrocell base stations;

a code detector for recognizing a first set of detected downlink codes that each have a pilot energy above a detection threshold by evaluating the downlink transmissions; and

a code selector for selecting an optimal downlink code for a femto node to use in connection with serving user equipment based upon the first set of detected downlink codes wherein the optimal downlink code is from a second set of downlink codes reserved for femto nodes, wherein the code selector is further for selecting a down-

link code with a smallest amount of detected energy as the optimal downlink code when all of the second set of downlink codes are included in the first set of detected downlink codes.

8. The apparatus of claim **7**, wherein a subset of the first set of detected downlink codes is included in the second set of downlink codes and a remainder of the first set of detected downlink codes is included in a third set of downlink codes associated with macrocells.

9. The apparatus of claim **7**, wherein the detection threshold is one of a preset threshold or an adaptively determined threshold.

10. The apparatus of claim **7**, wherein the code selector is further for selecting the optimal downlink code autonomously as part of a self calibration.

11. The apparatus of claim **7**, wherein the code selector is further for randomly selecting a downlink code from one or more downlink codes of the second set of downlink codes that are not members of the first set of detected downlink codes as the optimal downlink code.

12. A wireless communications apparatus, comprising:

means for receiving downlink transmissions from at least one of one or more neighboring femto nodes and one or more macrocell base stations;

means for recognizing a first set of detected downlink codes that each have a pilot energy above a detection threshold by evaluating the downlink transmissions; and

means for selecting an optimal downlink code for a femto node to use in connection with serving user equipment based upon the first set of detected downlink codes, the optimal downlink code being from a second set of downlink codes reserved for femto nodes, wherein the means for selecting the optimal downlink code comprises

means for selecting a downlink code with a smallest amount of detected energy when all the downlink codes of the second set of downlink codes are included in the first set of detected downlink codes.

13. The apparatus of claim **12**, wherein a subset of the first set of detected downlink codes is included in the second set of downlink codes and a remainder of the first set of detected downlink codes is included in a third set of downlink codes associated with macrocells.

14. The apparatus of claim **12**, wherein the detection threshold is one of a preset threshold or an adaptively determined threshold.

15. The apparatus of claim **12**, further comprising means for selecting the optimal downlink code autonomously as part of self calibration.

16. The apparatus of claim **12**, wherein the means for selecting the optimal downlink code further comprises means for randomly selecting a downlink code from one or more downlink codes of the second set of downlink codes that are not members of the first set of detected downlink codes.

17. A non-transitory computer-readable medium comprising codes for causing a computer to:

receive downlink transmissions from at least one of one or more neighboring Home femto nodes and one or more macrocell base stations;

evaluate the downlink transmissions to recognize a first set of detected downlink codes that each have a pilot energy above a detection threshold; and

select an optimal downlink code for a femto node to use in connection with serving user equipment based upon the first set of detected downlink codes, the optimal downlink code being from a second set of downlink codes reserved for femto nodes, wherein selecting the optimal downlink code comprises selecting a downlink code

with a smallest amount of detected energy as the optimal downlink code when all of the second set of downlink codes are included in the first set of detected downlink codes.

18. The non-transitory computer-readable medium of claim **17**, wherein a subset of the first set of detected downlink codes is included in the second set of downlink codes and a remainder of the first set of detected downlink codes is included in a third set of downlink codes associated with macrocells.

19. The non-transitory computer-readable medium of claim **17**, further comprising codes for causing the computer to randomly select a downlink code from one or more downlink codes of the second set of downlink codes that are not members of the first set of detected downlink codes as the optimal downlink code.

20. In a wireless communications system, an apparatus comprising:

a memory; and

a processor operably coupled to the memory and configured for:

receiving downlink transmissions from at least one of one or more neighboring femto nodes and one or more macrocell base stations;

evaluating the downlink transmissions to recognize a first set of detected downlink codes that each have a pilot energy above a detection threshold; and

selecting an optimal downlink code for a femto node to use in connection with serving user equipment based upon the first set of detected downlink codes, the optimal

downlink code being from a second set of downlink codes reserved for femto nodes, wherein selecting the optimal downlink code comprises selecting a downlink code with a smallest amount of detected energy when all the downlink codes of the second set of downlink codes are included in the first set of detected downlink codes.

21. The apparatus of claim **20**, wherein a subset of the first set of detected downlink codes is included in the second set of downlink codes and a remainder of the first set of detected downlink codes is included in a third set of downlink codes associated with macrocells.

22. The apparatus of claim **20**, wherein selecting the optimal downlink code further comprises randomly selecting a downlink code from one or more downlink codes of the second set of downlink codes that are not members of the first set of detected downlink codes.

23. The method of claim **1**, wherein the receiving, evaluating, determining, and selecting are performed by the femto node for which the optimal downlink code is selected.

24. The method of claim **1**, wherein each downlink code corresponds to one of a plurality of primary or secondary scrambling codes associated with a given carrier frequency.

25. The method of claim **1**, further comprising selecting a carrier frequency for the femto node to use in connection with serving the user equipment prior to selecting the optimal downlink code, the optimal downlink code being one of a plurality of downlink codes associated with the selected carrier frequency.