Claims

What is claimed is:

1. A method for ranging using orthogonal frequency division multiplexed (OFDM) signals, the method comprising:

receiving a first OFDM signal at a receiver at a first bandwidth;

measuring a signal power of each of a plurality of symbols of subcarriers for the first OFDM signal;

determining a signal anomaly in the first OFDM signal based on the signal power of each of the plurality of symbols in the first OFDM signal;

increasing the first bandwidth to a second bandwidth;

receiving a second OFDM signal at the second bandwidth;

calculating a range from a transmitter of the second OFDM signal to the receiver based on the second OFDM signal at the second bandwidth.

2. The method of claim 1, wherein the first OFDM signal and the second OFDM signal comprise at least one of 4G. 5G LTE, or WiFi signals.

3. The method of claim 1, wherein the first bandwidth comprises a first number of subcarriers being assigned to the receiver and the second bandwidth comprises a second number of sub-channels greater than the first number of subcarriers being assigned to the receiver.

4. The method of claim 1, wherein the signal anomaly comprises multipath signal propagation and the determining comprises:

measuring a difference between the highest measured signal power and the lowest measured signal power for the plurality of symbols and comparing the difference to a threshold flatness value.

5. The method of claim 1, wherein the plurality of symbols comprise positioning reference signals of the OFDM.

6. The method of claim 1, wherein the plurality of symbols comprise positioning reference signals and at least one other symbol of the OFDM.

7. The method of claim 6, wherein the at least one other symbol of the OFDM comprises a data symbol encoding transmitted data from the transmitter to the receiver.

8. The method of claim 1, further comprising:

measuring a signal power of each of a plurality of symbols of subcarriers for the second OFDM signal;

determining a slope corresponding to the difference in phase of the plurality of symbols of subcarriers for the second OFDM signal relative to frequency of the OFDM signal; and

calculating a transmission delay based on the slope that is used to determine the range.