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(54) Title: SYSTEM AND METHODS FOR ANTENNA OPTIMIAZATION FOR WIRELESS BROADBAND COMMUNICATION

(57) Abstract: A system and method for antenna optimization for wireless broadband communication is provided. Such an enhanced antenna array includes higher-gain antenna and lower-gain antenna. The beamforming antenna, both higher-gain and lower-gain, are designed to be able to transmit to and receive from another transceiver. The higher-gain antenna may be designed to form a more directional beam substantially closer to the horizon; whereas the lower-gain antenna is capable of forming a less directional beam at a distance further from the horizon. In both cases, the antenna may form their respective beams anywhere in the 360 degrees horizontally around the antenna array. The higher-gain antenna may include a coverage area from the horizon to a substantially acute angle from the horizon in the vertical direction. In contrast, the lower-gain antenna may have coverage from the substantially acute angle from the horizon to substantially vertical. The substantially acute angle may be approximately 10 degrees in some cases. In some cases the lower-gain antenna may include four elements. Likewise, in some embodiments, the higher-gain antenna may include four elements as well.