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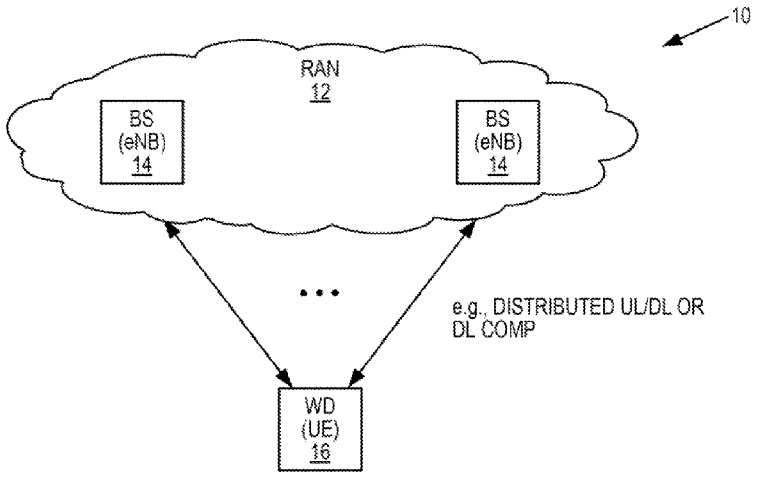

FIG. 11

(57) Abstract: Systems and methods are disclosed for estimating one or more channel properties of a downlink from a cellular communications network based on quasi co-located antenna ports with respect to the one or more channel properties. In one embodiment, a wireless device receives a downlink subframe including a downlink control channel from the cellular communications network. The wireless device estimates one or more large-scale channel properties for an antenna port of interest in the downlink control channel based on a subset of reference signals that correspond to antenna ports in the cellular communications network that are quasi co-located with the antenna port of interest with respect to the one or more large-scale channel properties. As a result of using the quasi co-located antenna ports, estimation of the one or more large-scale channel properties is substantially improved.

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