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**Sorrentino et al.**

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(54) **METHODS AND ARRANGEMENTS FOR CHANNEL ESTIMATION**

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**H04W 56/00** (2009.01)

(52) **U.S. Cl.**  
CPC ..... **H04W 56/001** (2013.01); **H04W 56/0095** (2013.01)

USPC ..... **370/324**

(58) **Field of Classification Search**  
USPC ..... 370/324, 350, 507  
See application file for complete search history.

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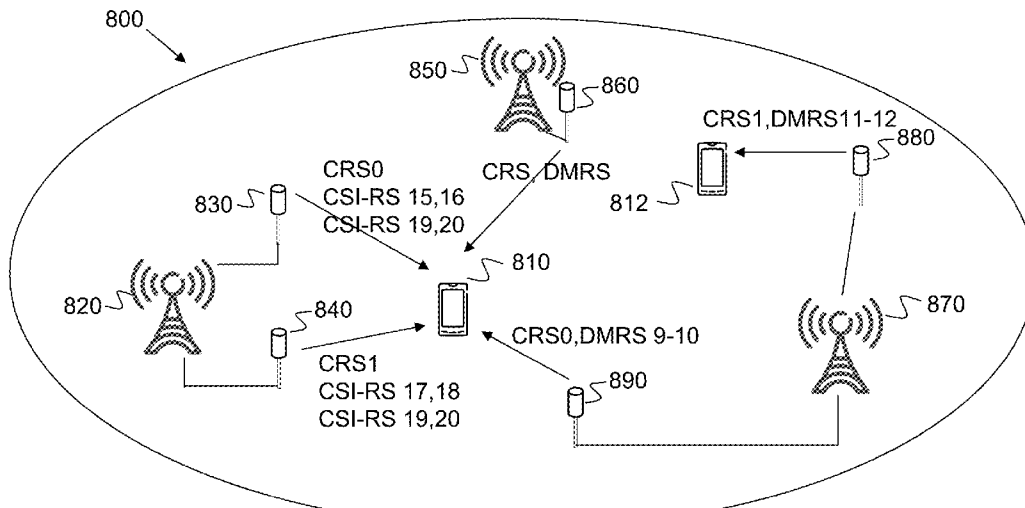
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(57) **ABSTRACT**

Some embodiments provide a method for channel estimation in a wireless device. According to the method, the wireless device obtains an indication that a set of antenna ports, or antenna port types, share at least one channel property. The wireless device then estimates one or more of the shared channel properties based at least on a first reference signal received from a first antenna port included in the set, or having a type corresponding to one of the types in the set. Furthermore, the wireless device performs channel estimation based on a second reference signal received from a second antenna port included in the set, or having a type corresponding to one of the types in the set, wherein the channel estimation is performed using at least the estimated channel properties.

**13 Claims, 12 Drawing Sheets**



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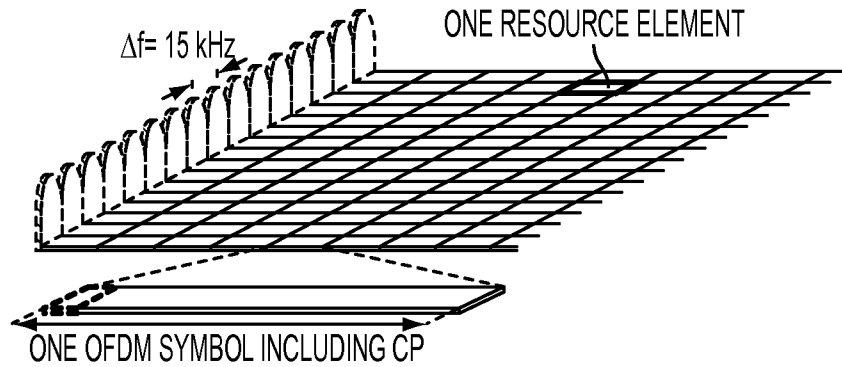


FIG. 1

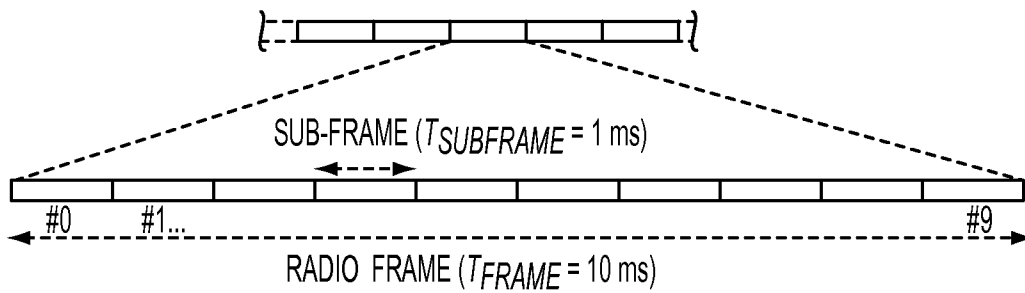


FIG. 2

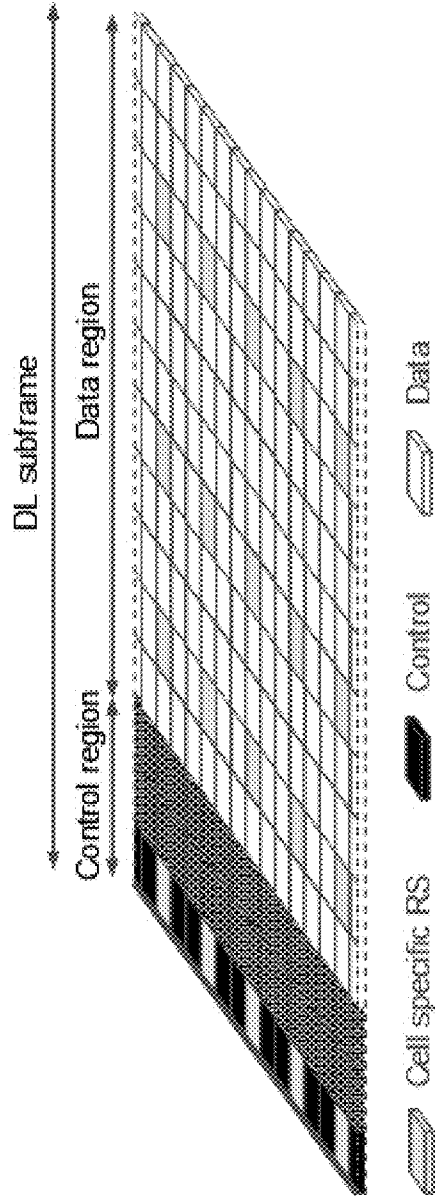


Figure 3

one pattern

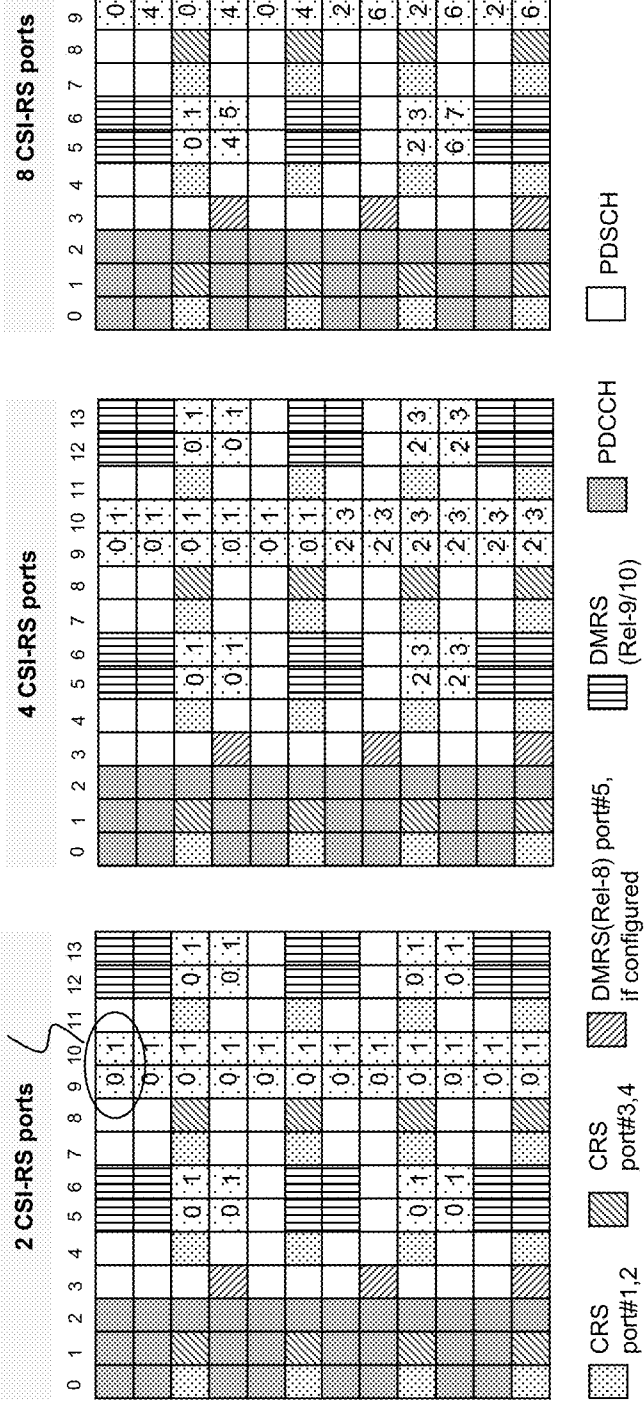


Figure 4

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