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论文

天线阵列方位对MIMO无线信道性能的影响

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摘要
分析收发天线阵列的方位对MIMO无线信道的空域相关性及其容量的影响, 得出在散射信号角度扩展较小时, 这种影响不容忽视, 为得到更大的信道容量, 应使阵列法线尽可能指向来波/去波平均方向. 数值结果证实了天线阵列方位对相关系数的影响, 并指出这种影响随天线阵列法线偏离其信号平均方向而增大. 仿真结果表明信号角度扩展较小的阵列的方位对信道容量影响更大, 增大信号角度扩展可以削弱以至消除这种影响.

关键词 阵列方位 MIM0信道 空域相关性 信道容量 角度扩展

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Impact of Antenna Array Orientation on Performance of MIMO Wireless Channels

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Abstract
Orientation of the receive and transmit antenna arrays is always omitted while researching the performance of wireless channels. This paper investigates the impact on spatial correlation and capacity of MIMO （Multiple-Input Multiple-Output） wireless channels, and obtains that the impact can not be neglected if angular spread is small, and that the antenna arrays should be rotated to make array′s normal point to the mean direction of arrival or departure （DOA or DOD） to attain higher capacity. Numerical results verify the impact on spatial correlation, and show that it increases with the departure ofarray′s normal from the mean DOA or DOD. The simulation results indicate that orientation of the array with smaller angular spread dominates the impact on MIMO channel capacity and that increasing angular spread diminishes, or even eliminates this impact.

Key words Array orientation MIMO channels Spatial correlation Channel capacity Angular spread

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