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一种新型复合结构笼型中馈天线

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摘要 提出一种新型复合结构的笼型中馈天线．将笼型与不对称双锥结构相结合，展宽了天线的阻抗和方向图带宽，抑制了天线辐射方向图在宽频带内上翘或裂瓣．在馈电位置引入螺旋短截线，有效降低了天线的高度．采用矩量法对天线进行仿真和优化，设计并制作了一副超短波(VHF／UHF)宽频带天线．实测结果表明在100～750MHz频带内无须匹配或加载网络即可满足电压驻波比小于3.0：1，在整个工作频带(100～400MHz)内增益平坦且大于1.5dBi．此外，天线高度和常规偶极子天线相比减小了约50%．

关键词 笼形中馈天线 短截线 宽带天线

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Novel center-fed cage antenna using the composite structure

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Abstract

A novel center-fed cage antenna using the composite structure is proposed. The antenna has a composite structure of a cage and an asymmetric biconical structure. The impedance bandwidth and radiation pattern bandwidth are enhanced, and the tilting and ripping of radiation patterns are eliminated. A helical shorting wire is used to reduce the antenna height effectively. The antenna is analyzed and optimized by the method of moments (MOM). A prototype operating in VHF / UHF bands is constructed and tested. Measured results show that a VSWR (less than 3.0:1) bandwidth of 650 MHz(100～750MHz), without additional matching or loading network, is obtained. The overall measured radiation gain of the proposed antenna in the horizontal plane is stable and larger than 1.5dBi in the operating frequency band(100～400MHz). Furthermore, a size reduction rate of 50% compared with a general dipole antenna is realized.

Key words center-fed cage antenna shorting wire broadband antenna

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