

Sintesi Di Array Lineari Basata Sul Metodo Di Fourier

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Abstract

Uno dei principali vantaggi degli array è che l'eccitazione assegnata ad ogni elemento radiante può essere strettamente controllata per la sintesi di diagrammi di radiazione con lobi secondari molto ridotti o con forma arbitraria. A tal fine, sono state sviluppate numerose procedure per la sintesi di array factor desiderati. Questi metodi rientrano in tre principali classi di sintesi: sintesi di shaped patterns; sintesi di pattern con lobi secondari ridotti e lobo principale stretto; procedure che ottimizzano alcuni parametri dell'array (solitamente in ricezione), come il guadagno o il SNR.

Tra le tecniche di sintesi appropriate per la generazione di beampattern sagomati, il metodo basato sulla trasformata di Fourier presenta numerosi vantaggi in termini di semplicità, velocità di sintesi e interpretabilità fisica. In particolare, il metodo di sintesi basato sulle serie di Fourier permette di ottenere il minimo errore quadratico medio tra il pattern desiderato e quello ottenuto mediante l'array, se esso presenta una spaziatura pari a mezza lunghezza d'onda tra gli elementi. La presente attività progettuale si pone l'obiettivo di implementare la tecnica di sintesi di Fourier per array lineari seguendo le linee guida presentate in letteratura e di verificarne il corretto funzionamento in test case di riferimento.

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