

# SYNTHESIS OF SUB-ARRAYED TIME-MODULATED LINEAR ARRAY WITH PREFIXED ELEMENTS EXCITATIONS

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## Abstract

In molte applicazioni che impiegano array di antenne l'importanza di poter sagomare il fascio della potenza irradiata (power pattern o beam pattern) ed avere un comportamento dei lobi secondari controllato (sidelobe level, SLL, basso) a seconda dell'utilizzo e' fondamentale al fine di utilizzare un solo dispositivo, permettendo di ridurre costi e spazio fisico occupato.

Rispetto alle antenne convenzionali, gli array che sfruttano una modulazione nel tempo introducono una quarta dimensione - il tempo - nel processo di sintesi. Quindi ulteriori gradi di libertà da impiegare sono considerati. Questi permettono da un lato di aumentare la flessibilità nel design dell'antenna, dall'altro di poter riconfigurare il fascio andando ad agire solamente sul tipo di modulazione temporale utilizzata.

Un problema legato a questo tipo di tecnica basata su modulazione nel tempo è legata al fatto che si generano segnali indesiderati a frequenza multipla di quella di modulazione, che naturalmente implicano uno spreco di potenza. Per questo in fase processo di ottimizzazione si deve essere in grado di definire una modulazione temporale, che oltre a soddisfare i requisiti legati alle prestazioni dell'antenna nella banda desidera, deve mirare a ridurre lo spreco di potenza nella trasmissione dei segnali indesiderati.

Inoltre, l'utilizzo di tecniche legate al sub-arraying al fine di ridurre la complessità circuitale dell'antenna e allo stesso tempo ottenere antenne in grado di generare più fasci e' stata ampiamente utilizzata e descritta in letteratura. In questo modo ulteriori gradi di libertà si aggiungono al procedimento di sintesi dell'antenne. L'obiettivo e' quello di realizzare un sistema che integri i concetti di "time-modulation" e "sub-arraying" al fine di ottenere un sistema in grado di adattarsi in modo efficace ed efficiente alle condizioni di operazione richieste.

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