surface missiles will be proposed. It will be shown that by integrating the components of the velocity to be gained vector directly in the body frame, there is no need for computing the transformation matrix from body frame to any other reference frame, and hence a simple guidance law for a system with its gyros and accelerometers directly attached to the body can be realized.

* *Presented at the AIAA Guidance, Navigation and Control Conference, August 12-14, 1991. NewOrleans/ Louisiana, U.S.A.*

WAVE PROPAGATION MODELING IN OPTICALLY MODULATED PASSIVE OR ACTIVE MEDIA*

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ABSTRACT

We have modeled the wave propagation in the media with perturbed refractive index which is called optically modulated in space. It has been assumed that the modulation index in the media is varied periodically in space.

We start with wave equation, which is second order partial differential equation with space-varying coefficient. This equation cannot be solved in general case. But for small modulation index we reduce the wave equation to the coupled-mode equation. As the next step we have modeled the coupled-mode equation in the form of the state-variable equation with constant coefficient, which can easily be solved.

Based on the solution of the above mentioned state variable equation we have analyzed the properties of such a device to show how such a device can work as coupling input array with N single mode fiber elements to output array with N single mode fiber elements, which has an important application in optical fiber networks.

* *Presented at International' 92 Alexandria conference, Applications of Signals, Data, Systems Methodologies, December 28-30, 1992. Eskandari, Egypt.*

EFFECT OF CASTING CONDITIONS ON THE PERFORMANCE OF LOW-PRESSURE CELLULOSE ACETATE MEMBRANES*

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ABSTRACT

Effect of casting conditions on the performance of cellulose acetate membranes is investigated. The emphasis has been on the development of low-pressure membranes. With the polymer concentration of about 27 to 28 percent cellulose acetate in equimolar solution of acetone and formamide, it is shown that the annealing temperature and evaporation time are respectively the most important casting conditions which affect the performance of the membranes. At annealing temperatures of about 50 - 70 $^{\circ}c$, the salt rejection of the membrane increases sharply, passing through a maximum, without significant loss in water permeability. Furthermore, annealing temperatures of less than 50 $^{\circ}c$ and more than 70 $^{\circ}c$ are not recommended.

Evaporation time is the next important casting parameter. At evaporation times of 7 to 15 seconds at room temperature, the salt rejection increases sharply without significant loss in permeability.

The performance of the low pressure membranes developed in this work has been compared with those recently reported in the literature, both asymmetric and composite types, and it is shown that there exists limitations on the improvement of asymmetric membranes. However, these membranes can provide acceptable permeability and salt rejection for low-cost, line - pressure applications.

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MICROCELLUAR MOBILE AND PORTABLE RADIO COMMUNICATIONS CELLULAR LAYOUT AND SYSTEM ARCHITECTURE*

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ABSTRACT

Geometrical properties of flexible and variable size rectangular-shaped microcellular mobile and portable radio systems are described. This geometry conforms well with the propagation conditions typical of low antenna-height base stations to be used in urban microcellular environments. Methods to locate adjacent and cochannel cells are proposed and a fixed channel assignment algorithm capable of allocating channels to rectangular cells under diversified sets of conditions is presented.

* *Presented at GLEB COM'92 July 8-10, 1992. Orlando, USA.*

ON THE NUMBER OF COMMON TRIPLES IN MULTI-SET DESIGNS*

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ABSTRACT

A two-fold multi-set triple system is a collection of triples chosen, possibly with repetitions, from a V-set in such a way that each pair (whether distinct or not) occurs precisely two times. For instance the triple *(x, x, y)* contains *(x, x)* once and *(x,y)* twice. The design is called simple if it contains no repeated blocks. Let I *(v)* denote the set of non-negative integers *s* such that there exist two simple two-fold multi-set triple systems of order *v* with precisely *s* blocks in common. We determine I *(v)* for all admissible *v*. In our constructions of designs we apply concepts of graph theory such as two factorizations. This is a joint work with Elizabeth J. Billington.

* *Presented at Workshop in Combinatorial Mathematics, June 24 - July 18, 1992. Brisbane and Perth, Australia.*

DOPPLER ESTIMATION BY MA MODEL AND ITS COMPARISION WITH FFT*

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ABSTRACT

We propose an efficient novel method for Doppler frequency estimation in MTI Radar; based on white noise assumption and using second order canceler in the receiver. These conditions make the MA (moving - average model) valid. Based on some realistic numerical assumptions we will compare the results of this model by classic FFT (fast Fourier transform) estimator. By presenting the performance analysis we will show the degree of improvement which can be obtained by the proposed new estimation method.

* *Presented at Recent - Result and Hot - Topics June 30- July 8, 1991. Rhodes, Greece*

Q-GUIDANCE IN ROTATING COORDINATES*

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ABSTRACT

A simplified guidance law for short range surface to

ABSTRACTS OF PAPERS PRESENTED AT INTERNATIONAL CONFERENCES

The abstracts of papers published in this magazine pertain to research projects conducted all over I.R. Iran, including those papers which have been printed previously in reputable scientific publications, and are not limited to the Sharif University of Technology. The Editor would be happy to include abstracts, in future editions, of all scientific papers presented by researchers throughout the country, with a view to keeping the academia and professionals informed about research activities carried out by Iranian scientists.

LOW TEMPERATURE CONDUCTIVITY OF ULTRA THIN DEPOSITS OF AG ON GE (100)*

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ABSTRACT

We present low temperature conductivity data on ultra thin (d < 25 Å) Ag layers grown on Ge(001) 2X1 substrates under UHV conditions. Samples grown at 160K and subsequently annealed at room temperature appear to have an intermediate layer plus islands structure. The islands are elongated in one of two normal directions. After air exposure, these samples show a maximum in their electrical resistance at about 8 K and a minimum around 5 K. The current and magnetic field dependence of the resistance between 8K and 0.7K is consistent with an incomplete superconducting transition. Although all samples show an increase in overall resistance with time after air exposure, the transition temperature remains fairly constant. The increase in resistance below 5K is ascribed to normal regions within the intermediate layer.

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