STUDY OF SURFACE BONE REMODELLING V. S. TIME IN LONG BONES SUBJECTED TO A CONSTANT AXIAL LOAD*

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ABSTRACT

The surface bone remodelling justifies the bone size changes due to subjected loads. Theoretical prediction of surface remodelling in long bones subjected to a constant compressive axial load has been done by others. In their analysis, variation v.s. time of surface remodelling has not been investigated precisely. Hence, in this paper by employing numerical- finite element method, variation v. s. time of surface remodelling will be analysed. In this method bone cross-section will be divided into a number of boundary elements. It is assumed that all variations are linear during time step Δt. By using this technique primarily the nodes displacement and thus their new positions at the end of time step Δt will be defined and then by repeating the same procedure for the next time steps, the analysis for a long period of time can be performed. In conjunction to this need, an appropriate software program is developed.

Referred to the results obtained by running the program, eight classes of answers have been reached, which are in the same order as the other investigators. In addition, in this paper, the following have been obtained:

1- In the remodelling process, it has been noticed that, three classes of the model will reach to a stable condition, three other classes to an unstable condition and two remaining classes sometimes to a stable or an unstable condition, depending on the case.

2- In all stable conditions, it has been noticed that the rate of remodelling decreases as time goes on which is in accordance with clinical results.

CHARACTERISTIC OF DISPERSION SHIFTED FIBERS*

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ABSTRACT

Single- mode lightwave systems have completely replaced multi-mode as the technology of choice for long- haul, metropolitan interoffice, and subscriber loop systems.

In single mode fiber the dispersion can be zero in 1300nm but with higher attenuation; in 1550nm the loss can be as low as 0.2 db/km but dispersion is not zero. Recently dispersion shifted fiber has been introduced having both properties of zero- dispersion and low loss together at 1550nm.

In this paper we will review new possibilities to system designers: dispersion shifted fiber that is optimized for 1550nm system. Also, you will find an example of using dispersion- shifted fiber in long unrepeated submarine systems.

ANALYZER COMPUTER PROGRAM *

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ABSTRACT - An ANALYZER program was developed to analyze data from repeated load tests. The program was interactive and user friendly, It was designed to perform median filtering and average processing of the data, to print graphs of load, LVDT output and strain after average processing at different time sequences, and to create files containing the average deviator load, resilient and permanent deformations, and resilient and permanent strains at different time sequences.

processors.In this paper characteristics of equations concerned and application of parallal processing are pointed out. Conventional routines applied in power system transients are presented and compared for evaluation of a simple power system stability model after a short circuit. The effects of hardware structure and ways of partitionning the equations in connection with the integration routine used are discussed.

LOW - PRESSURE MEMBRANES: NEW DEVELOPMENTS AND APPLICATIONS*

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ABSTRACT

Recent developments in the membrane materials and fabrication methods in order to reduce the pressure (or energy) requirement of membrane processing are reviewed and critically discussed. These developments include the improvements in casting conditions for asymmetric membranes, fabrication of the new thin- film composite membranes, and selection of new membrane materials. Many applications have evolved in recent years which include low-pressure (low energy) water desalination, membrane water softening, treatment of hazardous wastes, and food processing.

A TEMPERATURE PROGRAMMED DESORPTION STUDY OF THE H_2O/V_2O_5 SYSTEM*

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ABSTRACT

The interaction of water vapor with a polycrystalline V_2O_5

thin film ($=1\ cm^2$) has been investigated by temperature programmed desorption (TPD). The desorption was studied at various H_2O exposures including 50, 200, 400 and 720 L. From the TPD desorption spectra, it was found that water desorbed from the V_2O_5 surface at a temperature $T_M \simeq 390$ K for a surface coverage $\theta_{H_2O} \simeq 0.20$ ML corresponding to 720 L. Dependence of T_M on the surface coverage and the rate of desorption was noticed to increase with rise in H_2O exposures. Second order desorption kinetics have been identified for the process with an activation energy $E_d \simeq 11.7 \pm 0.2$ kcal/mol. No molecular H_2 was observed during H_2O desorption from the V_2O_5 surface. A model based on dissociative adsorption of H_2O and resultant recombinative desorption is proposed showing that the desorption proceeds from two adjacent vanadium sites, $- V^{5+} - O - V^{4+} --$.

GEOMETRIC ADAPTABILITY: A NOVEL MECHANICAL DESIGN IN THE SHARIF ARTIFICIAL HAND*

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ABSTRACT

Significant motions of the human hand for grasping purposes are identified and presented. Based upon these motions, a minimum of two independent degrees of freedom have been considered in the design and fabrication of the proposed artificial hand. As a result, the first experimental model is able to duplicate five out of the six main grasping types of the human hand. Furthermore, the significant design feature of the SAH named Geometric Adaptability (meaning being able to adapt the hand's multi-jointed elastic fingers to curl around unknown shaped objects being grasped or held) is explained, and within this context kinematics and design issues are discussed.

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.

SYNTHESIS OF 1-ALLYLOXY-1-SILOXYCYCLO-PROPANES AND 1 - PROPARGYLOXY-1- SILOXYPROPANES*

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ABSTRACT

1- Allyloxy- 1-siloxycyclopropanes and 1- propargyloxy-1- siloxycyclopropanes were synthesized from allyl ß-iodo-propionates and propargyl ß-iodopropionates respectively, by treatment with zinc-copper couple and silylating agents.

ESSENTIAL POINTS IN SIMULATION ALGORITHMS OF TRANSIENT RESPONSE FOR POWER SYSTEMS & USE OF PARALLEL PROCESSING*

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ABSTRACT

Integration routines constitute the main part of simulation algorithm for power system transients. Speed & accuracy are the key issues of selecting a proper algorithm which is very much affected by the integration routine used and the method of distributing equations between the