Contents

KINEMATICS OF A 3-*PRP* PLANAR PARALLEL ROBOT

Damien CHABLAT, Stefan STAICU

Recursive modelling for the kinematics of a 3-PRP planar parallel robot is presented in this paper. Three planar chains connecting the moving platform of the manipulator are located in a vertical plane. Knowing the motion of the platform, we develop the inverse kinematics and determine the positions, velocities and accelerations of the robot. Several matrix equations offer iterative expressions and graphs for the displacements, velocities and accelerations of the three prismatic actuators.

Keywords: kinematics, planar parallel robot, singularity

A SOLUTION FOR GUIDANCE EQUATIONS IN THE PLANAR CASE OF HOMING MISSILES BASED ON SERIES DEVELOPMENT

Teodor-Viorel CHELARU, Valentin PANĂ

The paper is an original approach to the guidance equations of homing missile problem based on series development. The purpose of this approach is double. The first is a technical one; to obtain an approximate solution which can be used for real time models employed in combat system of fight aircraft. The second purpose is a scientific one to use the results in other theoretical development in guidance low synthesis. The work is focused on obtaining the equation solution and evaluating the accuracy of the solution for different numbers of terms and finally to relieve the influence of different parameters of the problem for the miss distance and its speed.

KEYWORDS: guidance, series development, homing missile

NUMERICAL PREDICTION OF HEAT TRANSFER ON TRANSONIC TURBINE BLADES AT OFF DESIGN OPERATING CONDITIONS

Dorin STANCIU, Alexandru DOBROVICESCU

The goal of this paper is to investigate the performances of the v2-f (*Lien and Durbin, 1996*) *and ζ-f* (*Hanjalic et al., 2004*) *turbulence models in predicting the external heat transfer distribution on a high turning turbine blade working in transonic regime at off design operating conditions. The turbulent heat flux was modeled first in the hypothesis of constant turbulent Prandtl number and secondly with the aid of the algebraic relation for turbulent thermal diffusivity of Rokni and Sunden* (*2003*)*. The numerical results show that the surface heat transfer coefficient is quite correctly predicted by both turbulence models in all the regions were the boundary layer is fully turbulent. Despite the realizable condition of Durbin, at the stagnation point the heat transfer rate remains over-predicted when the* Pr_t*=const. hypothesis is used, but the algebraic relation of Rokni and Sunden fixes this problem. Unfortunately, the boundary layer transition is simulated too early by both turbulence models, which also have some difficulties in predicting the real shock wave structure.*

Keywords: numerical simulation, external heat transfer, turbine blades

CONSIDERATION ABOUT HIGH-PRESSURE REACTORS WITH CYLINDRICAL SYMMETRY

Valeriu V. JINESCU, Ionel POPESCU

High-pressure reactors used in industrial purpose are manufactured in compound construction. The closest components to the synthesis capsule (a die and two anvils) are made from WC-Co alloy. These components are binded with steel rings. In this paper the experiments made to establish a correlation between the physical-mechanical properties of tungsten carbide dies and the linear relations are presented. The plastic deformation of the die made from tungsten carbide resulted in the assembly process is shown.

Keywords: high-pressure reactors, die, multilayer, wc-co alloy**.**

A STUDY OF DELIVERY PERFORMANCE SYSTEM MEASUREMENT AT END CUSTOMER

Dana Maria PISAI

A comparative study between two existing measuring performance systems is presented which belong to two of the small and medium enterprises currently performing in Romania. Each of these small enterprises have its own measuring system focusing on certain key performance indicators (KPY's). We think that the originality of the article comes from the two different measurement systems as well as the non-existence of a similar study for Romania small and medium enterprises.

Keywords: key performance indicators, OTTR, final client satisfaction, supply chain.

DYNAMIC RESEARCH AND PROCEDURE TO OBTAIN A USEFUL DOMAIN OF DYNAMOMETERS FOR MACHINE TOOLS

Miron ZAPCIU, Jean-Yves K'NEVEZ, Raynald LAHEURTE, Philippe DARNIS

Vibration analysis has long been used for the detection and identification of machine tool condition. The specific characteristics of the transfer function of the dynamometers used in machine tool research aria are detailed in the papers. The main focus is on identifying a procedure to obtain eigen frequencies for dynamometers used to improve the cutting process on the machine tool.

Keywords: dynamometers, vibration, transfer function.

ON THE OPTIMAL DESIGN OF HELICAL SPRINGS OF AN AUTOMOBILE SUSPENSION

Aurel P. STOICESCU

The paper presents the optimal design method of the helical springs of the automobile suspensions according to the criterion of the minimum mass. For this purpose, at a given spring rate, the torsional stress corresponding to the maximum force applied to the spring, the fatigue stress, the buckling stability condition and the constraints relating to the spring index and to the outer coil diamete are considered. The work example allows also to draw more general conclusions.

Key words: automobile suspension, helical spring, optimal design, spring mass

MODELING DATA ANALYSIS OF THE SPECIAL INSTALLATION OPERATING WITH EQUIPPING THE FIRE ENGINES

Dan ROBESCU, Aurel TROFIN

In this paper, data obtained from exploitation of special devices mounted on fire engine vehicles are modeled using the MathCAD code. The least square method for the exponential distribution and an original method for determining the Weibull and Poisson distributions are used.

Keywords: reliability, fire engines, operating data, density function.

CONTRIBUTIONS TO MODELLING THE THRESHING AND SEPARATING PROCESS WITHIN A THRESHING APPARATUS WITH AXIAL FLOW

Valentin VLĂDUȚ, Lucreția POPA, Sorin BIRIȘ, Sorin BUNGESCU, Aurel DANCIU

The aim of this paper was to obtain a mathematical model for characterizing the threshing and separating process within the axial flow of the threshing

apparatus (B90 thresher), taking into consideration only 7 of the most important input parameters: Q (kg/s), n (rpm), δ (m), ρ (kg/ m^3), v_a (m/s), L (m) and S (m^2). In order to control the modelling process there were also established the output parameters: S_s - the probability distribution of separated seeds, S_d - the density function of the separated seeds, S_l - the probability distribution of free seeds within the threshing area and S_n - the probability distribution of unthreshed seeds, p_{ev} - value of exhaust losses.

Keywords: modelling, threshing apparatus, seeds, separation