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ТА СОЦІАЛЬНИХ КОМУНІКАЦІЙ



СОЦІАЛЬНО-ГУМАНІТАРНІ АСПЕКТИ РОЗВИТКУ СУЧАСНОГО СУСПІЛЬСТВА

МАТЕРІАЛИ ВСЕУКРАЇНСЬКОЇ НАУКОВОЇ КОНФЕРЕНЦІЇ ВИКЛАДАЧІВ,
АСПІРАНТІВ, СПІВРОБІТНИКІВ ТА СТУДЕНТІВ

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large number of cracks modelling periodical arrangements have been tested to investigate performance of the method; these include arrays of collinear cracks, parallel cracks, and double network of parallel cracks. Comparisons with analytical and numerical periodical solutions available for the mentioned cases reveal high accuracy and fast performance of the method. It is also applied for studying effective characteristics of bodies with up to 20,000 cracks and for accurate modelling of interaction of a macrocrack with thousands of microcracks.

This study is aimed at the development of fast, accurate and convenient methods for stress analysis of solids with substantial number of random or oriented cracks. Investigation of collective behaviour of cracks in solids is important in many applications, such as determination of effective deformation characteristics of highly cracked materials or rocks, analysis of fracture accumulation prior to propagation, etc. Although numerical methods are well developed for crack problems the account for crack interaction turns out to be a challenging problem of numerical analysis when the number of cracks is large.

Some computing characteristics showing advantages of the ACA solver for the problems involving large number of cracks were summarised. It is evident that both the CPU time and storage requirement grows linearly with respect to the number of unknowns in SLAE. The approach has been verified against analytical solutions for periodical crack arrangements. The results obtained for the fracture characteristics indicate that these agree with those found analytically, which confirms that the method is capable to handle efficiently multi-crack large-scale plane problems.

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STRUCTURE, PHYSICAL AND MECHANICAL PROPERTIES OF THE NITRIDE COATINGS BASED ON Hf, V, Ta, DEPOSITED BY MAGNETRON SPUTTERING

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In recent years we have seen increased scientific interest in combinations of transition metals that improve the physico-mechanical and structural properties of coatings. Such elements as: Hf, V, Ta - steel are considered as potential candidates. Due to promising mechanical properties and resistance to high temperatures, nitride compounds of Hf, V, Ta are

receiving increased attention from researchers and end-users. Nitride systems were deposited via magnetron as well as reactive spraying with the help of ion implantation (CMSII). Spraying was performed in an atmosphere of Ar/ and it is worth noting that the variation of partial pressure leads to the formation of multi-phase coatings with amorphous, crystalline and quasi-amorphous phase. The study of the structure and the physico-chemical properties were performed using the SEM, XPS, XRD and AES techniques. The coatings were deposited on a steel substrate 4140 and Cr12MoV, by depositing monolayers one by one. For the multilayer system Ta/TaN, a transition layer was fabricated using ion bombardment of Ta at 20 keV. After deposition the wear resistance was measured using the ball-on-disc method. The results showed that the strengthening of adhesion of a multilayer film of Ta/TaN - is a result of a reduction in stress and an increased plasticity after depositing alternating layers of Ta. To further improve adhesion, deposition of alternating layers of Ta was performed with ion implantation. Measurements of corrosion and polarization resistance were also taken. It was found that an improvement in corrosion resistance could be obtained with the help of multi-element systems as well as through an increase in the number of layers in the multilayer coating. This can be explained by a decrease in the size of the pores which facilitate the penetration of aggressive environments. It is worth noting that the analysis of polarization and corrosion resistance was performed using theoretical methods as well as being confirmed experimentally. An important factor in increasing the corrosion resistance is the quantity as well as the composition of the interfaces of the monolayers that causes a decrease in pore size.

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INFORMATION WARFARE

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During the radical changes, which are taking place in our country, we are clashed with the phenomenon of information aggression in the media of our neighbor, Russia.

Information and psychological confrontation is a form of confrontation parties representing the use of special (political, economic, diplomatic, and other) methods, ways and means to influence the