

INTEGRATED CAE DEVELOPMENT OF PRECESSIONAL DRIVES USING AUTODESK INVENTOR PLATFORM

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Abstract: The modelling and simulation of precessional drives designed in two variants capable of high transmission ratio and torque for one stage compact construction are required both in the design phase and fabrication. Calculation of planetary precessional transmission by a simulation is carried out using the simplified 3D model created in program Motion Inventor 2004+. Dynamic processes in planetary precessional transmission derive, to a great extent, from the interaction of conical rollers of the satellite crowns with generating surfaces of central wheel teeth. The bearing capacity defined by gear forces (static and dynamic), the noise emission and the

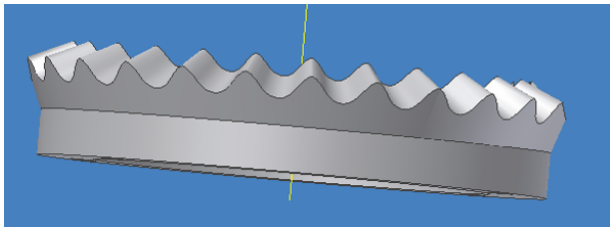


Fig. 1. 3D model of the central wheel

transmission vibroactivity, depend on the gear dynamic processes on the whole. With account of these important factors in the elaboration of 3D model of the central wheel (fig. 1) was designed by using CAD Autodesk Inventor. The dynamic model has been created on the basis of rigid model. Kinematic joints (fig. 2) have been enclosed according to movements in gearing. The simulation of model precessional gearings has been created in some stage. At the first stage has been executed the kinematic analysis, from definition of the following parameters: transfer ratio, absolute angular speed of the block satellite, relative angular speed of the block satellite, angular speed on the output shaft. At the following stage has been executed the kinetostatics analysis with calculation and simulation of total loadings in gearings.

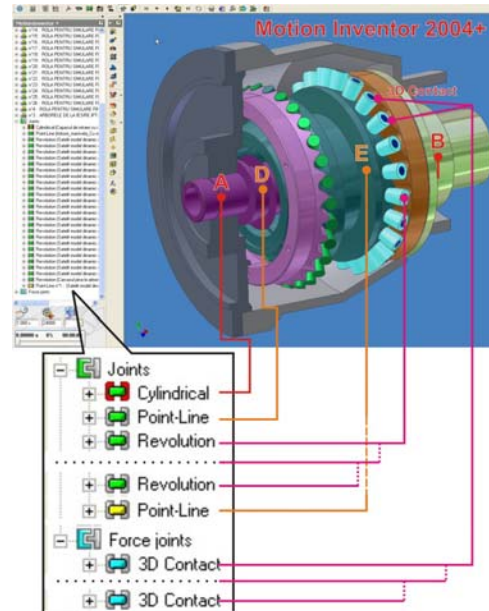


Fig. 2. Kinematics joints in the planetary precessional transmission

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