

## 56. ON SOME APPROXIMATIONS OF THE RESULTANT CONTACT FORCES AND THEIR APPLICATIONS IN RIGID BODY DYNAMICS

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### **Abstract**

The work presents the possible applications and effectiveness of certain class of models of the resultant friction force and rolling resistance. The friction models are based on the integral model constructed under assumption of fully developed sliding on the plane contact area of general shape and any pressure distribution. Then the integral model of friction force and moment are approximated based on Padé approximants and their generalizations. These models are expected to be computationally effective in numerical simulations of rigid bodies with frictional contacts, such like billiard balls, Thompson top, the wobble stone and many others. In the present work two different examples of application of the developed contact models are presented and tested: a) a billiard ball rolling and sliding on the plane horizontal table; b) a full ellipsoid of revolution in contact with plane and horizontal base.