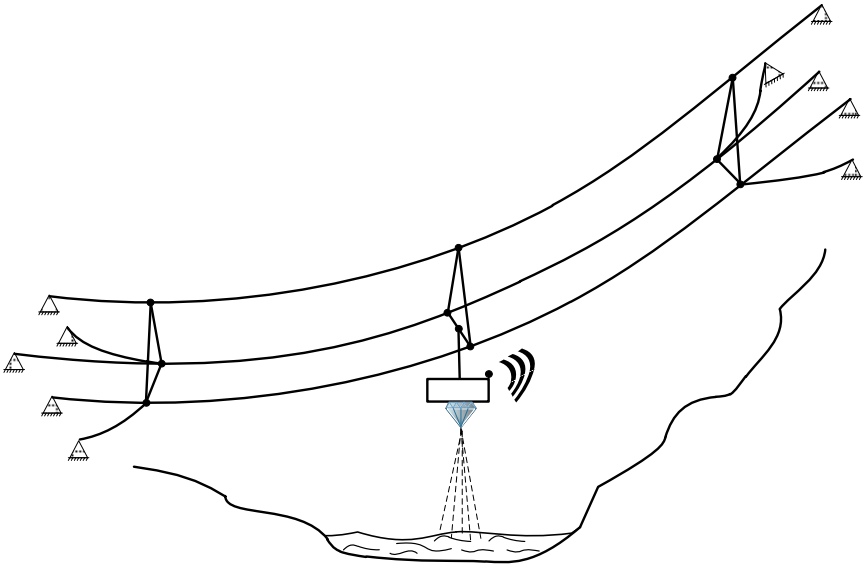
ON CALCULATION OF SOME NONSTANDARD STRUCTURES BY DISCRETE MODEL OF SOLID DEFORMABLE BODIES AND ALGORITHM OF SUCCESSIVE APPROXIMATIONS

David Pataraia, N. Tsverikmazashvili., E.Tsotseria, A. Kartvelishvili, R. Maisuradze
The Tsulukidze Mining Institute, Tbilisi, Georgia

The approach of modeling and calculation of solid deformable bodies [1,2] which is, developed by us based on the discrete representation and special algorithm has been applied in the study of some complex non-standard structures. In particular, for a particular object (Devdoraki, Georgia) cable-rod system for arrangement of mudflow level alarm sensor was designed and calculated. This spatial beam of ropes incrementally related and interacting with rod structure supports the measuring device. (see Fig.) In design calculations of this system very stringent requirements were taken into account for a stable orientation of radar tracking beam, possibility of its longitudinal movement within a certain range, influence of disturbances caused by wind gusts, temperature jumps, icing.

Checking by control calculations, carried out in parallel using a standard software, based in most cases on the finite element method, confirms the validity of results obtained by the methods, developed by us and positive features and benefits of applied approach: practical suitability for modeling, calculating and design of nonlinear, large-size, non-standard designs and structures.



References

1. Pataraia D.: *Ein Beitrag zur diskreten Darstellung des Seiles* . Wissenschaftliche Arbeiten des Instituts fuer Eisenbahnwesen, Verkehrswirtschaft und Seilbahnen der TU Wien. Vienna, 1993, N2(32), pp. 32-38. (in german).
2. Pataraia D.: The calculation of rope-rod structures of ropeways on the basis of the new approach - International Organisation for Transportation by Rope (O.I.T.A.F.) / World Congress / Rio De Janeiro – Brazil / October, 2011, 24 – 27 / PAPERS OF THE CONGRESS / http://www.oitaf.org/Kongress%202011/Referate/Pataraia.pdf