



**Advances in Applications of Analytical
Methods for Solving Differential
Equations (Symmetry 2024)**

22 – 26 January 2024

BOOK OF ABSTRACTS

(JANUARY 20, 2024)

Virtual Host:

**Suranaree University of Technology
Nakhon Ratchasima, Thailand**

Multidimensional Riemannian metrics and their application for the integration of a system of Navier-Stokes equations

V. Dryuma

IMI of the State University of Moldova, Chisinau, Moldova; valdryum@gmail.com

The report will consider examples of metrics of multidimensional Riemannian spaces associated with the Navier-Stokes (NS) system of equations. In the case of a 14D metric with Riemann curvature R_{ijkl} and its Ricci curvature tensor R_{ik} , depending on the variety of the Lie group E^8 , it has four components that vanish, provided that the functions of pressure and velocity of the liquid satisfy the equations NS. The 8D-space metric is a composition of two 4D dual metrics with scalar Cartan invariants and is used to study the properties of flows with the Eulerian and Lagrangian approaches in describing the properties of flows of a viscous incompressible fluid. In the case of 6D-space, the Ricci tensor of the metric has nonzero components depending on the velocity functions U, V, W and is used to study the properties of its Ricci flows. The behavior of geodesic lines of metrics depends on the invariants of Cartan of the metrics and can be both regular and chaotic.