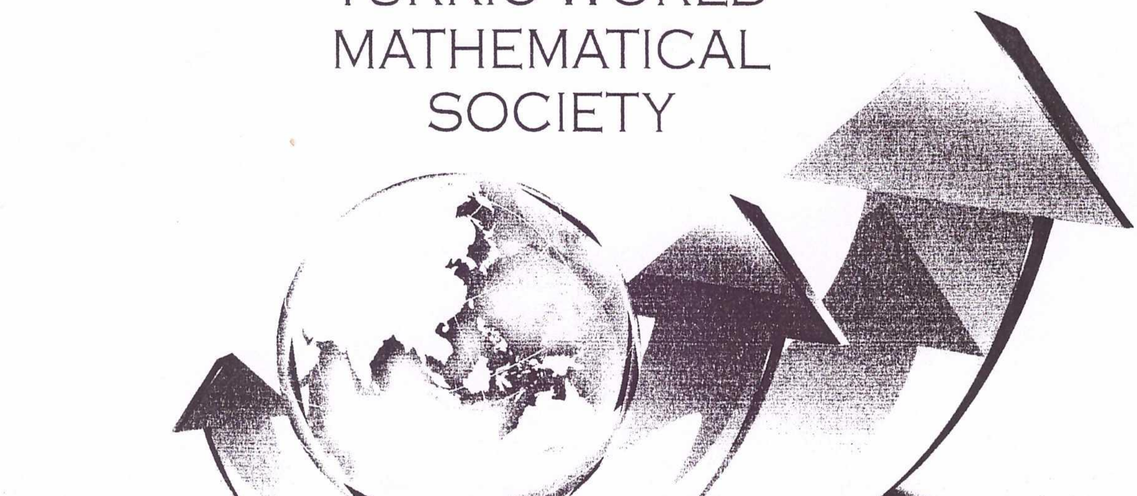
TURKIC WORLD
MATHEMATICAL SOCIETY

BOOK OF ABSTRACTS

IV

CONGRESS OF THE TURKIC WORLD MATHEMATICAL SOCIETY



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ALGORITHM FOR NUMERICAL REALIZATION OF THE "LOGARITHMIC" DIFFERENCE SCHEMES

N.M. Temirbekov, A.N. Temirbekov

Amanzholov East-Kazakhstan State University, Ust-Kamenogorsk, Kazakhstan

e-mail:nurik_tem@mail.ru

The most compact differential equations of gas dynamics appear in the Lagrangian mass variables (s,t) [1-2]:

$$\begin{cases} \dfrac{\partial}{\partial t_L}\left(\dfrac{1}{\rho}\right) = \dfrac{\partial u}{\partial s} \\ \dfrac{\partial u}{\partial t_L} + \dfrac{\partial p}{\partial s} = \dfrac{\partial}{\partial s}\left(\dfrac{\mu}{\mathrm{v}} \cdot \dfrac{\partial u}{\partial s}\right) \\ \dfrac{\partial \varepsilon}{\partial t_L} = -p\dfrac{\partial u}{\partial s} \end{cases} . \tag{1}$$

Algorithm for the numerical solution of equations of gas dynamics in Lagrange variables (1) using the "logarithmic" difference scheme is written as

First step:

$$\begin{aligned} U_{i+1/2} &= \tfrac{u_{i+1}^n + u_i^n}{2} - \left(p_{i+1}^n + p_i^n\right) + \\ &+ \left[\mu_{i+3/2} \cdot \tfrac{\ln \mathrm{v}_{i+1}^n - \ln \mathrm{v}_{i+1}^{n-1}}{\mathrm{v}_{i+1}^n - \mathrm{v}_{i+1}^{n-1}} \cdot \left(u_{i+1}^n - u_i^n\right) - \mu_{i+1/2} \cdot \tfrac{\ln \mathrm{v}_i^n - \ln \mathrm{v}_i^{n-1}}{\mathrm{v}_i^n - \mathrm{v}_i^{n-1}} \cdot \left(u_i^n - u_{i-1}^n\right)\right], \end{aligned} \tag{2}$$

$$P_{i+1/2} = \frac{p_{i+1}^n + p_i^n}{2} - (\gamma - 1) \cdot \varepsilon^n \cdot \left(\rho^2\right)^n \left(u_{i+1}^n - u_i^n\right). \tag{3}$$

Second stage:

$$\frac{\mathrm{v}_i^{n+1} - \mathrm{v}_i^n}{\tau} - \frac{1}{h} \cdot \left(U_{i+1/2} - U_{i-1/2}\right) = 0, \frac{u_i^{n+1} - u_i^n}{\tau} + \frac{1}{h} \cdot \left(P_{i+1/2} - P_{i-1/2}\right) = 0, \tag{4}$$

$$\frac{e_i^{n+1} - e_i^n}{\tau} + \frac{1}{h} \cdot \left(P_{i+1/2} \cdot U_{i+1/2} - P_{i-1/2} \cdot U_{i-1/2}\right) = 0, p_i^{n+1} = (\gamma - 1) \cdot \left(e_i^{n+1} - \frac{\left(u^2\right)_i^{n+1}}{2 \cdot \mathrm{v}_i^{n+1}}\right). \tag{5}$$

Calculations were performed up to time, in the field $(-1 \le x \le 1)$ has a flat layer of a viscous gas. To the left of break point $x = 0$, the state of the gas as follows: $\rho = 1$, $p = 1$, and right – $\rho = 0,125$, $p = 0,1$. The initial condition for velocity is given as $u = (1 - x)/31$.

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DETERMINATION OF GROSS EMISSIONS ... ON THE ENVIRONMENT CITY ...

A.N. Temirbekov

Amanzholov East-Kazakhstan State University, ...

e-mail:almas...

In this paper, we estimate the amount of energy ... cell decomposition of the territory of Almaty. It is assumed ... vehicle fleet, is uniformly distributed over the road network. ... non and brings enormous benefit to society. However, ... is accompanied by a number of negative phenomena causing ... ture, which may manifest itself as directly and as wasting ... environmental pollutants and makes it unfavorable changes.

To get started on a city map was overlaid uniform ... network in the city of Almaty. By this method was designed ... transport.

Motorization is a progressive phenomenon and brings ... with many of the benefits of motorization is accompanied by a ... ing substantial damage to society and nature, which may manifest ... resources. Auto-road complex is one of environmental pollutants ...

Currently, all the more urgent becomes the problem of ... gases, especially when driving in urban areas of complicated ... different modes of engine [2]. To begin with, we impose a uniform ... the cellular functions of the road network in Almaty, obtained ... considered algorithm was applied to the city of Moscow [3]. ... increments of 2 km (Figure 1). Applying the algorithm for ... the road network in the bands.

In Almaty, there are three categories of roads: Three Way ... two Way in the same direction (str Dzhandosov Str. ...

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