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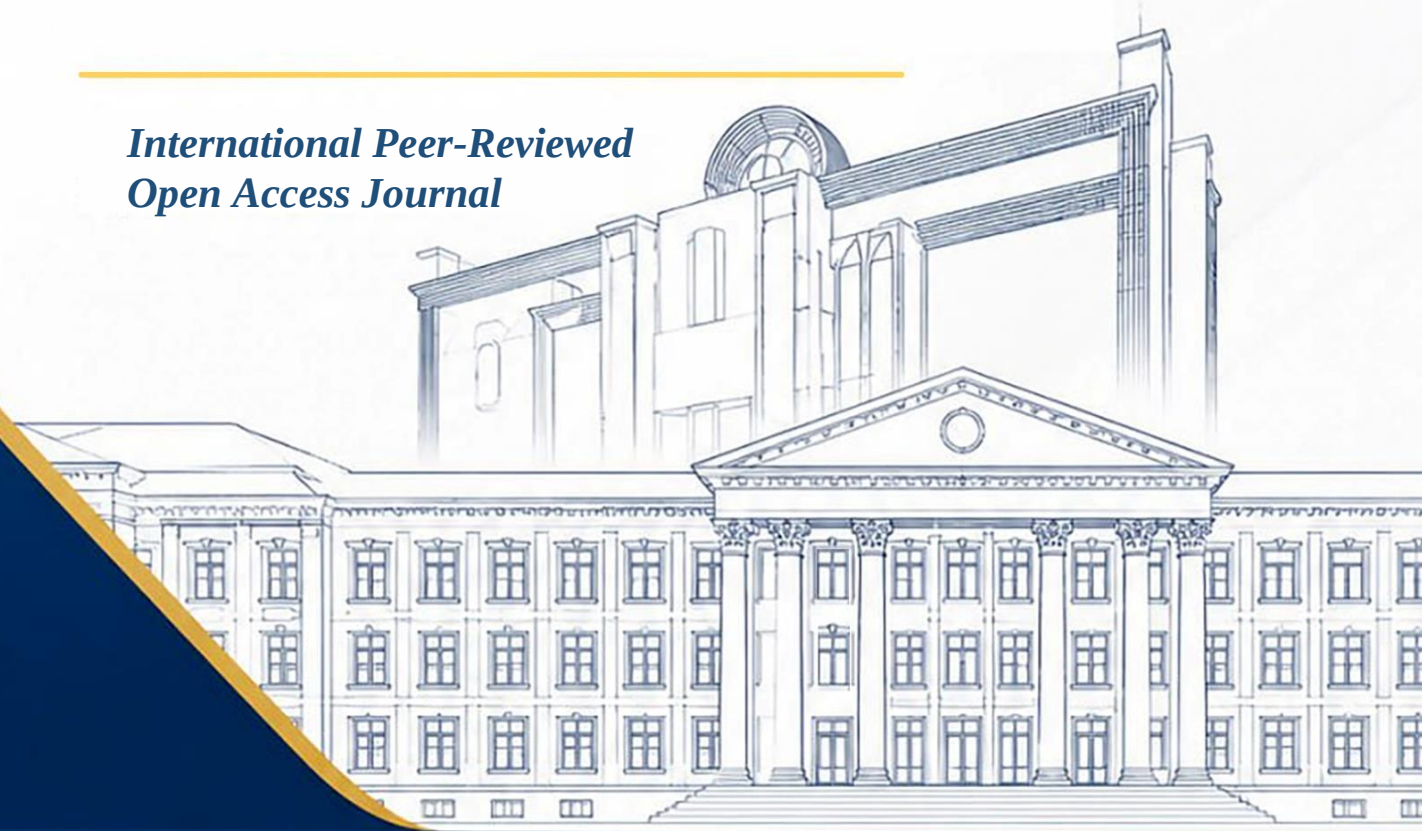
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- ✓ Aniq va tabiiy fanlarni o‘qitish metodikasi
- ✓ Ta’limda sun’iy intellekt va raqamli texnologiyalar
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2. Sheraliev B.M., Kayumova Y.K. Voprosы taksonomicheskogo polojeniya i oxranы golsov (Teleostei: Cobitoidei), rasprostranennыx v vodoemax Uzbekistana //Uzbekskiy biologicheskiy jurnal. – Tashkent, 2022. - № 2, –S. 35-40. (03.00.00; №5).
3. Komilova D., Qayumova Y., Sheraliev B. Qoradaryo suv havzasi ixtiofaunasining sistematik tur tarkibi // Xorazm ma'mun akademiyasi axborotnomasi, 2020. – №5/1. – B. 22-28.
4. Каюмова Ё. Текущий видовой состав и распространение голсов (Сйприниформес: Собитоидеа) в Ферганской долине // Путь науки, 2020, №12 (82), 20–22.
5. Qayumova Y.Q. Chodaksoy daryosi ixtiofaunasining tur tarkibi//FarDU ilmiy xabarlar.2024/3-son. Ilova to`plam. 461-465.
6. Турдаков Ф.А. Рыбы Киргизии. Фрунзе: Изд. АН КирССР, 1963. – 284 с.
7. Fricke R., Eschmeyer W.N., Fong, J.D. Eschmeyer's Catalog of Fishes: Genera/Species by Family/Subfamily.Electronic version accessed 11 Desember 2022.
8. Турдаков Ф.А. Материалы по ихтиофауне рек Средней Азии // Сборн. трудов Зоол. музея Моск. унив., 1941. – №6. – С. 215-224.
9. Sheraliev B.M., Kayumova Y.Q., Urmonova D.E., Rozimov A.D. A new candidate species of *Triplophysa* Rendahl, 1933 from the Fergana Valley. Scientific bulletin of QarSU, 2022. Vol. 51(1), – P. 28-31.
10. Правдин И.Ф. Руководство по изучению рыб (преимущественно пресноводных). 4-е изд. М.: Пищевая промышленность, 1966. – 374 с.
11. Лакин Г.Ф. Биометрия. – Москва: Высшая школа, 1990. – 350 с.
12. Решетников Ю.С.,Попова О.А.Кашулин Н.А., ЛукинА.А.,Амундсен П.А,Сталдвик Ф. Оценка благополучия рқбной части водного ообўества по результатам морфоогического анализа рыб//Успехи современной биологии-1999.-Т.119.-№2.-С.165-177.

CFD ANALYSIS OF PRESSURE AND VELOCITY DISTRIBUTION IN A VENTURI METER

Turaev Mukhammadi, Turaev Umarkhon, Solayjanova Mohira

Associate Professor of the Department of Preschool and Primary Education, Kattakurgan State Pedagogical Institute

Master, Dept. of Theoretical and Engineering Mechanics of Samarkand State University

Student, Urgench State University

ORCID: 0009-0006-3926-6211
0009-0003-4008-3349
0009-0004-1500-2508

| E-mail muhammaditura@gmail.com, turaev.umarkhon@samdu.uz mohirasalayeva09@gmail.com

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Abstract. This study investigates the flow behavior in a Venturi meter using computational fluid dynamics (CFD). The numerical model was developed in ANSYS Fluent based on the geometry and measurement configuration of an HM 150.07 Venturi tube apparatus. Water was used as the working fluid with an inlet velocity of 5 m/s. Pressure and velocity distributions were evaluated at six axial locations along the Venturi tube to characterize flow acceleration in the throat and pressure recovery in the diffuser. The CFD results demonstrate the characteristic relationship between cross-sectional area, velocity, and static pressure and provide detailed information on the internal flow field.

Key words. Venturi meter, Computational Fluid Dynamics, CFD, ANSYS Fluent, Pressure Distribution, Velocity Distribution, Flow Separation, Bernoulli equation.

INTRODUCTION

Venturi meters are widely used for flow-rate measurement in pipe systems because their operating principle is based on the fundamental relationship between flow velocity, pressure, and cross-sectional area. As fluid passes through the converging section of a Venturi meter, the reduction in flow area causes the velocity to increase and the static pressure to decrease. After the throat, the flow enters the diffuser section, where the increasing cross-sectional area leads to flow deceleration and partial pressure recovery.

The fundamental flow behavior in a Venturi meter can be described using the continuity and Bernoulli equations. For an incompressible steady flow, conservation of mass requires the flow velocity to increase as the cross-sectional area decreases. According to the Bernoulli equation, this increase in velocity is accompanied by a corresponding reduction in static pressure. Although these relationships provide a theoretical description of Venturi flow, the actual flow field may also be affected by viscosity, turbulence, wall friction, and flow separation in the diffuser region.

The internal flow structure of a Venturi meter can therefore be investigated in greater detail using computational fluid dynamics (CFD). Unlike measurements obtained at discrete locations, CFD allows the pressure and velocity fields to be examined throughout the computational domain and provides information about flow acceleration, pressure recovery, and local flow behavior in the diffuser section. This makes CFD a useful approach for analyzing the spatial characteristics of flow inside a Venturi meter.

In the present study, the flow field of a Venturi meter is investigated numerically using ANSYS Fluent. The geometry and measurement configuration of an HM 150.07 Venturi tube apparatus are used as the physical reference for developing the computational model and defining six axial sampling locations. Water is considered as the working fluid, and the numerical model is used to determine the static pressure and velocity magnitude at these locations. The obtained CFD results are analyzed to characterize the relationship between cross-sectional area, pressure, and velocity, with particular attention to flow acceleration in the throat and pressure recovery in the diffuser region.

THEORETICAL BACKGROUND

Fundamental Principles of Venturi Flow. The operation of a Venturi meter is primarily based on the conservation of mass and mechanical energy. When a fluid flows through a passage with a changing cross-sectional area, its velocity and static pressure change accordingly. For an incompressible steady flow, these changes can be described by the continuity and Bernoulli equations.

The conservation of mass for a steady flow can be expressed as

$$\dot{m} = \rho\, A\, u = const \tag{1}$$

$\dot{m}$ – mass flow rate

ρ – fluid density

A – cross-sectional area

u – mean flow velocity

For an incompressible fluid, the density remains constant, giving the continuity equation

$$A_1 u_1 = A_2 u_2 \tag{2}$$

The volumetric flow rate is related to the cross-sectional area and mean velocity by

$$Q = A\, u \tag{3}$$

Q – volumetric flow rate

For a circular pipe, the cross-sectional area is:

$$A = \frac{\pi D^2}{4} \tag{4}$$

D – local pipe diameter

Therefore, when the diameter decreases in the converging section of the Venturi meter, the flow velocity must increase to maintain a constant flow rate. In particular, if $A_1 > A_2$, then

$$u_2 > u_1$$

This relationship explains the velocity acceleration that occurs as the fluid approaches the throat of the Venturi meter.

Bernoulli Equation. The pressure variation associated with the change in velocity can be described by the Bernoulli equation. For steady, incompressible flow along a streamline, the equation is

$$\frac{p}{\rho} + \frac{u^2}{2} + gz = const \tag{5}$$

or, between two sections of the Venturi meter,

$$\frac{p_1}{\rho} + \frac{u_1^2}{2} + gz_1 = \frac{p_2}{\rho} + \frac{u_2^2}{2} + gz_2 \tag{6}$$

p – static pressure

u – flow velocity

g – gravitational acceleration

z – elevation of the corresponding section

For a horizontally positioned Venturi meter → $z_1 = z_2$ and Equation (6) can be simplified to

$$p_1 - p_2 = \frac{\rho}{2}(u_2^2 - u_1^2) \tag{7}$$

According to Equation (7), an increase in velocity is accompanied by a reduction in static pressure. Therefore, the throat, where the cross-sectional area is minimum, is expected to have a relatively high flow velocity and a low static pressure. After the throat, the cross-sectional area increases and the velocity decreases, resulting in partial pressure recovery.

The ideal behavior can therefore be summarized as $A\downarrow \rightarrow u\uparrow \rightarrow p\downarrow$, while in the diffuser section, $A\uparrow \rightarrow u\downarrow \rightarrow p\uparrow$.

These relationships form the theoretical basis for the numerical flow analysis presented in this study.

Venturi flow-rate relation:

$$Q = C_d A_2 \sqrt{\frac{2(p_1 - p_2)}{\rho(1 - \beta^4)}} \tag{8}$$

Real Flow Effects. Therefore, CFD analysis is employed in this study to examine the detailed velocity and pressure fields within the Venturi meter. Unlike discrete pressure measurements, the numerical model provides information throughout the computational domain, including the throat and diffuser regions.

VENTURI APPARATUS AND CFD METHODOLOGY

Venturi Apparatus Configuration. An HM 150.07 Venturi tube apparatus was considered as the reference configuration for the study. The apparatus consists of a converging section, a throat, and a diffuser section, with pressure-measurement locations distributed along the tube.

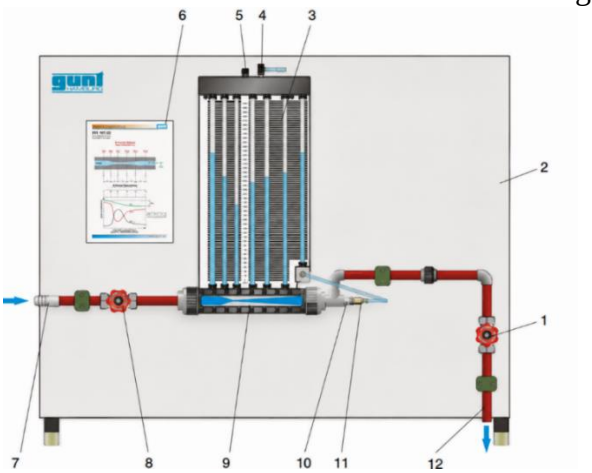


Figure 1. HM 150.07 apparatus – Venturi tube

Figure 1 shows the HM 150.07 Venturi tube apparatus used as the physical reference for the CFD model. The apparatus configuration includes the converging section, throat, diffuser, and pressure-measurement locations along the tube.

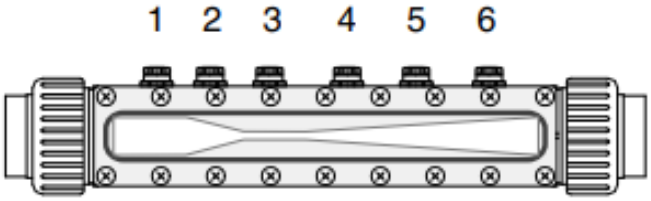


Figure 2. Measurement points along the Venturi tube

The six pressure-measurement locations of the apparatus were used as reference positions for extracting corresponding numerical pressure and velocity values from the CFD model.

These locations were subsequently adopted as sampling positions in the CFD model to obtain pressure and velocity values at corresponding axial locations.

CFD Model and Computational Mesh. A three-dimensional numerical model of the Venturi tube was developed in ANSYS based on the geometry of the HM 150.07 apparatus. The computational domain includes the converging section, throat, and diffuser.

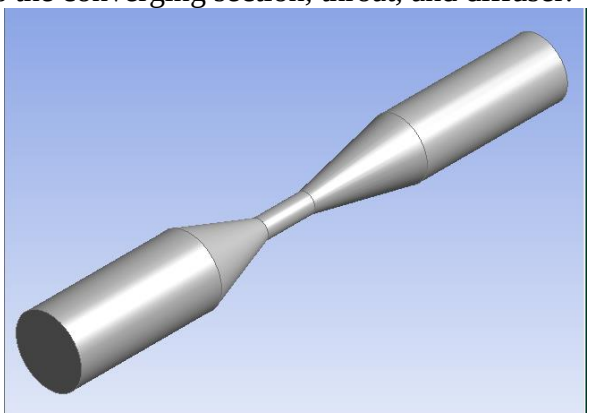


Figure 3. Venturi meter geometry in ANSYS DesignModeler

Figure 3 presents the computational geometry used for the numerical analysis. The model includes the main flow passage, converging section, throat, and diffuser.

After creating the geometry, the flow domain was discretized into computational elements. The resulting mesh is shown in Figure 4.

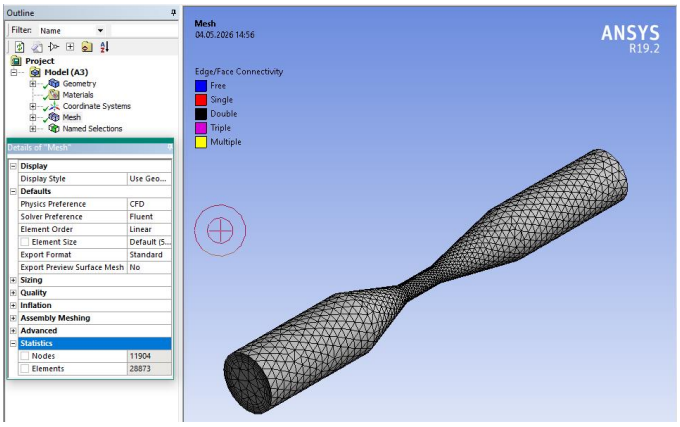


Figure 4. Meshed Venturi meter

The mesh was used to solve the flow field inside the Venturi tube. A finer representation of the geometry is important in the throat and diffuser regions because significant changes in velocity and pressure occur in these areas.

Boundary Conditions. Water was selected as the working fluid, and an inlet velocity of $5\ m/s$ was applied at the inlet of the computational domain. The flow was then calculated through the converging section, throat, and diffuser.

The basic inlet condition can be written as: $u_{inlet} = 5\ m/s$.

The numerical model was used to obtain the velocity and pressure distributions throughout the Venturi tube and at the six predefined axial sampling locations.

RESULTS AND DISCUSSION

CFD Pressure and Velocity Distribution. The pressure and velocity distributions were evaluated at six axial locations along the Venturi meter. The sampling points were placed on the central axis of the flow domain at $z = 0.20, 0.30, 0.45, 0.60, 0.75\ and\ 0.85\ m$. Static pressure and velocity magnitude were obtained using CFD-Post.

Figure 5 presents the CFD velocity field and streamlines along the Venturi meter. The velocity increases significantly as the flow approaches the narrow section and decreases after the throat as the flow enters the expanding section.

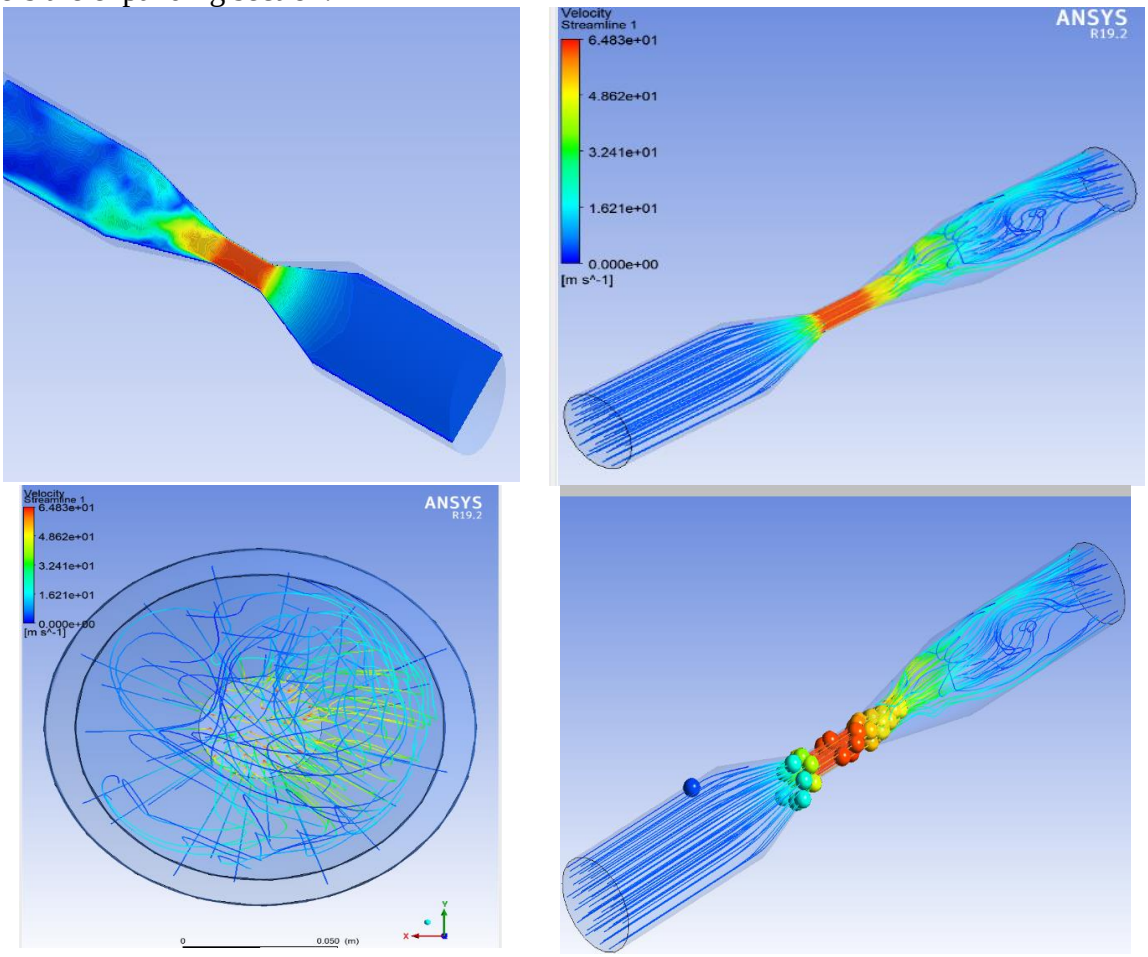


Figure 5. CFD velocity distribution and streamlines in the Venturi meter

The numerical values obtained at the six sampling locations are presented in Table 1.

Point	Axial position, $z\ [m]$	Static Pressure, $p\ [Pa]$	Velocity Magnitude, $u\ [m/s]$
1	0.20	-29 036.7	3.3783
2	0.30	-268 574	11.0195
3	0.45	-358 473	52.8002
4	0.60	-454 363	55.4844

5	0.75	1 087 220	5.8583
6	0.85	1 091 990	5.0130

Table 1. Static pressure and velocity magnitude at the six CFD sampling locations

To clearly indicate the locations used for the numerical data extraction, the six sampling points are shown in Figure 6.

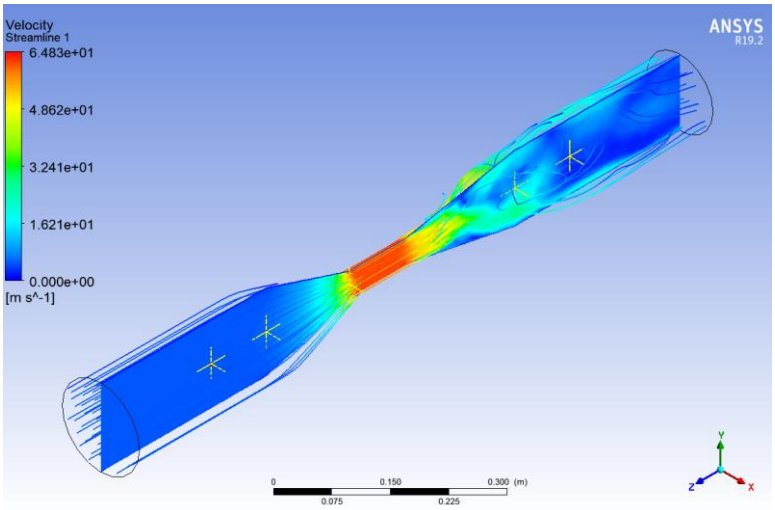


Figure 6. Locations of the six CFD sampling points

The results show that the velocity increases from 3.38 m/s at Point 1 to 55.48 m/s at Point 4, while the static pressure decreases from -29.04 kPa to -454.36 kPa. Among the six sampled locations, Point 4 has the highest velocity and the lowest pressure. The overall maximum velocity obtained from the CFD velocity field is approximately 64.83 m/s, occurring in the throat region. This behavior agrees with the basic Venturi principle, where a reduction in flow area results in an increase in velocity and a decrease in static pressure.

After the narrow section, the velocity decreases to 5.86 m/s at Point 5 and 5.01 m/s at Point 6, while the pressure increases to approximately 1.09 MPa. This indicates pressure recovery in the expanding part of the Venturi meter.

Flow Separation and Recirculation. The CFD visualization in Figure 5 also shows changes in the flow pattern downstream of the narrow section. As the flow passes into the expanding part of the Venturi meter, the increase in cross-sectional area causes the velocity to decrease and the pressure to recover. The streamlines indicate regions of disturbed flow and local recirculation in the diffuser region.

These flow features are important because they are not fully described by the ideal one-dimensional Venturi equations. CFD therefore provides additional information about the actual flow field, including the velocity distribution and flow behavior in the expanding section.

CONCLUSION

The CFD analysis successfully demonstrated the characteristic pressure and velocity behavior of water flow through the Venturi meter. The numerical results showed that the flow velocity increased as the fluid approached the throat, while the static pressure decreased in accordance with the continuity equation and Bernoulli’s principle. After passing through the throat, the velocity gradually decreased and partial pressure recovery occurred in the diffuser region.

The CFD results obtained at the six sampling locations provided a detailed representation of the pressure and velocity distribution along the Venturi tube. The numerical flow field also indicated disturbed flow and local recirculation downstream of the throat, which are associated with real-flow effects and energy losses.

Overall, the numerical analysis confirms the fundamental operating principle of the Venturi meter and demonstrates the capability of CFD to investigate pressure and velocity variations within

the flow domain. The HM 150.07 apparatus configuration and its pressure-measurement locations served as the physical reference for defining the CFD model and numerical sampling positions.

REFERENCES

1. Buranov Kh., Turaev U. “Modeling of Karman Vortices Around a Cylinder in CFD and Laboratory Conditions”. Ilmiy tadqiqotlar va ularning yechimlari jurnali, vol. 11, no. 2, June 2026, p. 9-14. https://doi.org/10.5281/zenodo.20520697

2. Ubaydullayev P.X., Babayev A.R. Suyuqlik mexanikasidan masalalar yechish usullari. O'quv qo'llanma. - Toshkent: TTYMI, 2011. – 152 b.

3. Turaev M., Turaev U. “Modeling and Visualization of Fluid Flow Through a Sudden Contraction”, Scientific Bulletin of the Kattakurgan State Pedagogical Institute, Vol. 1, Issue 1, June 2026, p. 114-119.

4. Abdirashidov A. Gidravlikadan amaliy mashg‘ulotlar. Uslubiy qo‘llanma.– Samarqand: SamDU nashri, 2007. – 114 b.

5. Xudoynazarov X., Abdirashidov A. Suyuqlik va gaz mexanikasi. O‘quv qo‘llanma. - Samarqand: Zarafshon nashri, 2017.- 360 b.

6. Дегтярев В. В. Улучшение судоходных условий сибирских рек. издательство «Транспорт», 1987 г.

7. Хикматов Ф.К. Гидравликадан амалий машғулотлар.-Тошкент: УзМУ нашри,1993.

8. Умаров А.Ю. Гидравлика. - Тошкент: Узбекистан, 2002. - 460 б.

LP(Г) FAZOLARDA SILJISHLI FUNKSIONAL OPERATORLARNING BIR TOMONLAMA TESKARILANUVCHANLIGI

Mardiyev Rasul*, *Boymurodov Jo‘rabek

Samarqand davlat universiteti, Matematik analiz kafedrasi dotsenti
Kattaqo‘rg‘on davlat pedagogika instituti, Aniq va tabiiy fanlar kafedrasi dotsenti

ORCID: 0009-0007-2429-7899
0009-0004-1094-6966
DOI: 10.68572/kdpi.2026.2.012

| E-mail mardiyevrasul@gmail.com
boymurodov.jurabek@mail.ru

Annotatsiya. Lebeg fazolarida siljish ixtiyoriy qo‘zg‘almas nuqtalar to‘plamiga ega bo‘lgan hol uchun siljishli funksional operator qaraladi. Siljishli funksional operatorning bir tomonlama teskarilanuvchanligining yetarlicha samarali mezonlari olingan bo‘lib, ular siljishli singulyar integral operatorlarning yarim Fredgolmlik mezonlarini olishda asosiy vosita hisoblanadi.

Kalit so‘zlar: siljishli funksional operatorlar, bir tomonlama teskarilanuvchanlik, siljish operatori, davriy nuqtalar.

Аннотация. В пространствах Лебега рассматривается функциональный оператор со сдвигом, когда сдвиг имеет произвольное множество неподвижных точек. Получены достаточно эффективные критерии односторонней обратимости функционального оператора со сдвигом, что является основным инструментом при получении критерии полунетеровости сингулярных интегральных операторов со сдвигом.

Ключевые слова: функциональные операторы со сдвигом, односторонняя обратимость, оператор сдвига, периодические точки

Abstract. A functional operator with shift in Lebesgue spaces is considered in the case where the shift has an arbitrary set of fixed points. Sufficiently effective criteria for the one-sided invertibility of the functional operator with shift are obtained. These criteria serve as a basic tool for deriving semi-Fredholmness criteria for singular integral operators with shift.

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