isotherm in unsteady groundwater flow in semi-infinite aquifer. International Conference on Modeling and Simulation of Diffusive Process and Applications *(ICMSDPA)*, pp. 60-67.

[14] Singh MK, Chatterjee A. (2016). Solute dispersion in a semi-infinite aquifer with specified concentration along an arbitrary plane source. Journal of Hydrology 541: 928-934. https://doi.org/10.1016/j.jhydrol.2016.08.003

[15] Wang HF, Anderson MP. (1982). Introduction to groundwater modelling, finite difference and finite element methods. Academic Press.

[16] Anderson MP, Woessner WW. (1992). Applied groundwater modeling—simulation of flow and advective transport. Academic Press, Inc., San Diego, CA, p. 381.

[17] Alam Md. S. (2016). Mathematical modeling for the effects of thermophoresis and heat generation/ absorption on MHD convective flow along the inclined stretching sheet in presence of Dufour sorret effect. Mathematical Modelling of Engineering Problems 3(3): 119-128. https://doi:10.18280/mmep.030302

[18] Jha BK, Yasuf TS. (2018). Transient pressure driven flow in an annulus partially filled with porous material: Azimuthal pressure gradient. Mathematical Modelling of Engineering Problems 5(3): 260-267. https://doi.org/10.18280/mmep.050320

[19] Singh MK, Das P, Singh VP. (2015). Solute transport in a semi-infinite geological formation with variable porosity. J. Engineering Mechanics, ASCE 141(11). https://doi.org/10.1061/(ASCE)EM.1943-7889.0000948

[20] Jaiswal DK, Yadav RR, Gulrana. (2013). Solute-transport under fluctuating groundwater flow in homogeneous finite porous domain. J. Hydrogeol Hydrol Eng. 2(1). https://doi.org/10.4172/2325-9647.1000103

[21] Freeze RA, Cherry JA. (1979). Groundwater, Prentice-Hall. Englewood Cliffs, NJ.

[22] Bear J. (1972). Dynamics of Fluid in Porous Media. Elsevier Publication Co. New York.

[23] Yim CS, Mohsen MFN. (1992). Simulation of tidal effects on contaminant transport in porous media. Ground Water 30(1): 78-86. https://doi.org/10.1111/j.1745-6584.1992.tb00814.x

[24] Scheidegger AE. (1957). The physics of flow through porous media. University of Toronto Press, Toronto, 329.

[25] Shukla AK, Pandya N. (2016). Effects of thermophoresis, Dufour, hall and radiation on an unsteady MHD flow past an inclined plate with viscous dissipation, chemical reaction and heat absorption and generation. Journal of Applied Fluid Mechanics 9(1): 475-485.

[26] Brice Carnahan HL, Wilkes JO. (1969). Applied Numerical Methods. John Wiley and Sons, New York.

[27] Todd DK. (1980). Groundwater Hydrology. John Wiley, New York, USA.

NOMENCLATURE

c'	concentration of the solute, kg m^{-3}
c	dimensionless concentration of solute
D	longitudinal dispersion coefficient, m^{2}s^{-1}
u	unsteady groundwater velocity, ms^{-1}
D_0	initial dispersion coefficient dispersion, m^{2}s^{-1}
u_0	initial groundwater velocity, ms^{-1}
c_0	reference / source concentration
x'	distance measured origin, m
x	dimensionless distance measured origin
t'	time, s
t	dimensionless time
m'	unsteady parameter regulates input, s^{-1}
m	dimensionless unsteady parameter
n'	unsteady parameter regulates dispersion, s^{-1}
n	dimensionless unsteady parameter
λ'	unsteady parameter regulates input, s^{-1}
R	dimensionless retardation factor
ξ	dimensionless parameter establishes relation between dispersion and groundwater
Δx	grid size of space variable
Δt	grid size of time variable
n_p	porosity of geological formation
k	dimensionless constant
K_d	distribution coefficient
K_1	adsorbing coefficient in solid
K_2	adsorbing coefficient in liquid