

عنوان مقاله:

Evaluation of the heat transfer rate increases in retention pools nuclear waste

محل انتشار:

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نویسندگان:

D. Domiri Ganji - Department of Mechanical Engineering, Islamic Azad University, Sari Branch, Sari, Iran

M. M. Peiravi - Department of Mechanical Engineering, Islamic Azad University, Sari Branch, Sari, Iran

M. Abbasi - Department of Mechanical Engineering, Islamic Azad University, Sari Branch, Sari, Iran

خلاصه مقاله:

In this paper, we have tried to find a solution for quick transfer of nuclear wastes from pools of cool water to dry stores to reduce the environmental concerns and financial cost of burying atomic waste. Therefore, the rate of heat transfer from atomic waste materials to the outer surface of the container should be increased. This can be achieved by covering the bottom of the pool space with conical fins (vertically) embedded in porous medium and allowing natural convection flow of Newtonian nanofluid upon it. In this research, we studied the rate of heat transfer by using such special space. In this study, Heat transfer boundary layer flow in Nano-fluidics shifting from a vertical cone in porous medium, two-dimensional, steady, incompressible and low speed flow have been considered and attempts have been made to obtain analytical solutions for it. The obtained nonlinear ordinary differential equation has been solved through homotopy analysis method (HAM), considering boundary conditions and Nusselt number. Also, Nusselt number, which is an important parameter in heat transfer, is calculated using the obtained analytical solution by HAM. A comparison of the obtained analytical solution with the numerical results represented a remarkable accuracy. The results also indicate that HAM can provide us with a convenient way to control and adjust the convergence region.

کلمات کلیدی:

Nuclear wastes, Homotopy Analysis Method (HAM), Porous media, Newtonian nanofluid, Similarity solution, Ordinary (differential equations) (ODE)

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