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Existence and Smoothness of solution of Navier-Stokes equation on R3 OGNJEN VUKOVIC, University of Liechtenstein — Navier-Stokes equation has for a long time been considered as one of the greatest unsolved problems in three dimensions. This paper proposes a solution to the aforementioned equation on R3. It proves the existence and uniqueness of smooth solution. Firstly, the concept of turbulent solution is defined.It is proved that turbulent solutions become strong solutions after some time in Navier-Stokes set of equations. However in order to define the turbulent solution, the decay or blow-up time of solution must be examined. Differential inequality was defined and it was proved that solution of Navier-Stokes equation exists in a finite time although it exhibits blow-up solutions. The equation is introduced that establishes the distance between the strong solutions of Navier-Stokes equation and heat equation. As it is demonstrated, as the time goes to infinity, the solution of heat equation is identical to the solution of N-S equation. As the solution of heat equation is defined in the heat-sphere, after its analysis,it is proved that as the time goes to infinity, solution converges to the stationary state. The solution has a finite time and it exists when that implies that it exists and it is periodic. The aforementioned statement proves the existence and smoothness of solution of N-S on R3.

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