**Development of a numerical code based on the finite volume method for solving two-dimensional Navier-Stokes equations in steady state**

**1. Introduction & Methodology**

The equation of momentum in the x and y directions is discretized using the finite volume method and has the following general form:

|  |  |
| --- | --- |
| (1) |  |

The continuity equation is converted into a pressure correction equation using the SIMPLE algorithm, and the final discrete equation is written in the form of equation (1):

For the discretization of the quantities on the control volume surfaces, the upstream difference approach and the power method are used.

The governing equations, which are Navier-Stokes, are defined in the following two-dimensional form:

|  |  |
| --- | --- |
| (2) |  |
| (3) |  |
| (4) |  |

**2. Results**

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|  |
| Figure 1 Stream Line |

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|  |
| Figure 2 |
|  |
| Figure 3 |

Considering the pressure correction factor of 0.1 and velocity correction of 0.7, the results for the 17 x 17 grid and Reynolds 100, respectively, for the flow lines, the vertical and horizontal components of the velocity are drawn in Figure )1(,(2),(3).

More Results are available in the appendix.