**PROJECT -3**

Buckley- Leverett equation

………………………………………………………………………………………………………… (1)

On assuming, sinӨ=90 degrees we get the following expression,

Where,

**Solution of Buckley -Leverett Equation without operator splitting**

We discretise the B-L equation using single point upstream weighting,

………………………………………………………………………………………………………… (1)

**Initial Conditions**

**Boundary conditions**

……………………………………. (2)

**Solution of Buckley-Leverett equation by Operator Splitting**

**Concept of Operator Splitting**

(Concept of Operator Splitting)

We solve the B-L equation in two steps. In the first step, we solve for convection and in the next step we solve for gravity and we update the convective solution for the same time step.

**Convective step**

…………………………………………………………………………………………. (3)

Initial Condition

Boundary condition

We discretise the above equation by single point upstream weighting method.

………………………………………………………………………… (4)

We get the saturation at a particular time-step throughout the grid from the convective step.

Then we go to the diffusive step

**Gravity or diffusive step**

……………………………………………………………………………………………...(5)

Initial condition

Boundary Condition

We discretise the above equation by single point upstream weighting.

…………………………………………………………………... (6)

We continue this process through all the time steps.







