$\hat{p}$ = pressure predicted by CNN
$\hat{v}$ = velocity predicted from $\hat{p}$

$\hat{p} = \phi(v_0)$

$\hat{v} = v_0 - \nabla\hat{p} \Rightarrow v_0 - \nabla\phi(v_0)$

v_L = Velocity target/Label

Criterion:

① $\| \phi(v_0) - p_L \|^2$ } Current Loss — MSE of pressure prediction ($MSE\ \hat{p}$)

+

② $\| v_0 - \nabla\phi(v_0) - v_L \|^2 \Rightarrow \| \hat{v} - v_L \|^2$ } MSE of Velocity (predicted) ($MSE\ \hat{v}$)

+

③ $\| \nabla \cdot (v_0 - \nabla\phi(v_0)) \|^2 \Rightarrow \| \nabla \cdot \hat{v} \|^2$ } Penalize any divergence of the predicted velocity field ($\nabla \cdot \hat{v}$)

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① Need batch size × $(\hat{p})$ × H × W for input

batch size × (p_L) × H × W for Labels

②&③ Need batch size × $(v_x, v_y, \hat{p})$ × H × W for input

batch size × (v_{Lx}, v_{Ly}) × H × W for Labels