Incompressible flow in pipes and channels

Eldhose Iype

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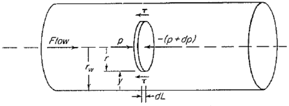
Shear-stress distribution



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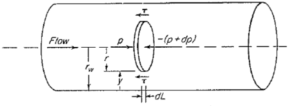

Applying momentum balance for the disc shaped fluid element

$$\frac{dp}{dL} + \frac{2\tau}{r} = 0$$

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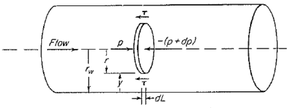

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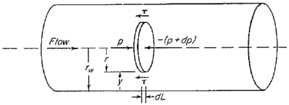

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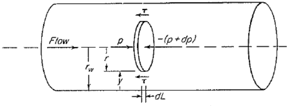
$$\frac{dp}{dL} + \frac{2\tau_w}{r_w} = 0 \qquad (1)$$



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Combining both equations, we get

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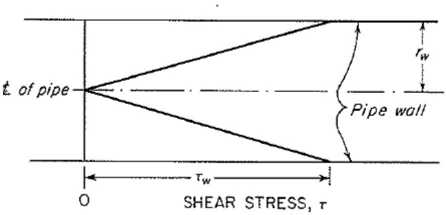

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