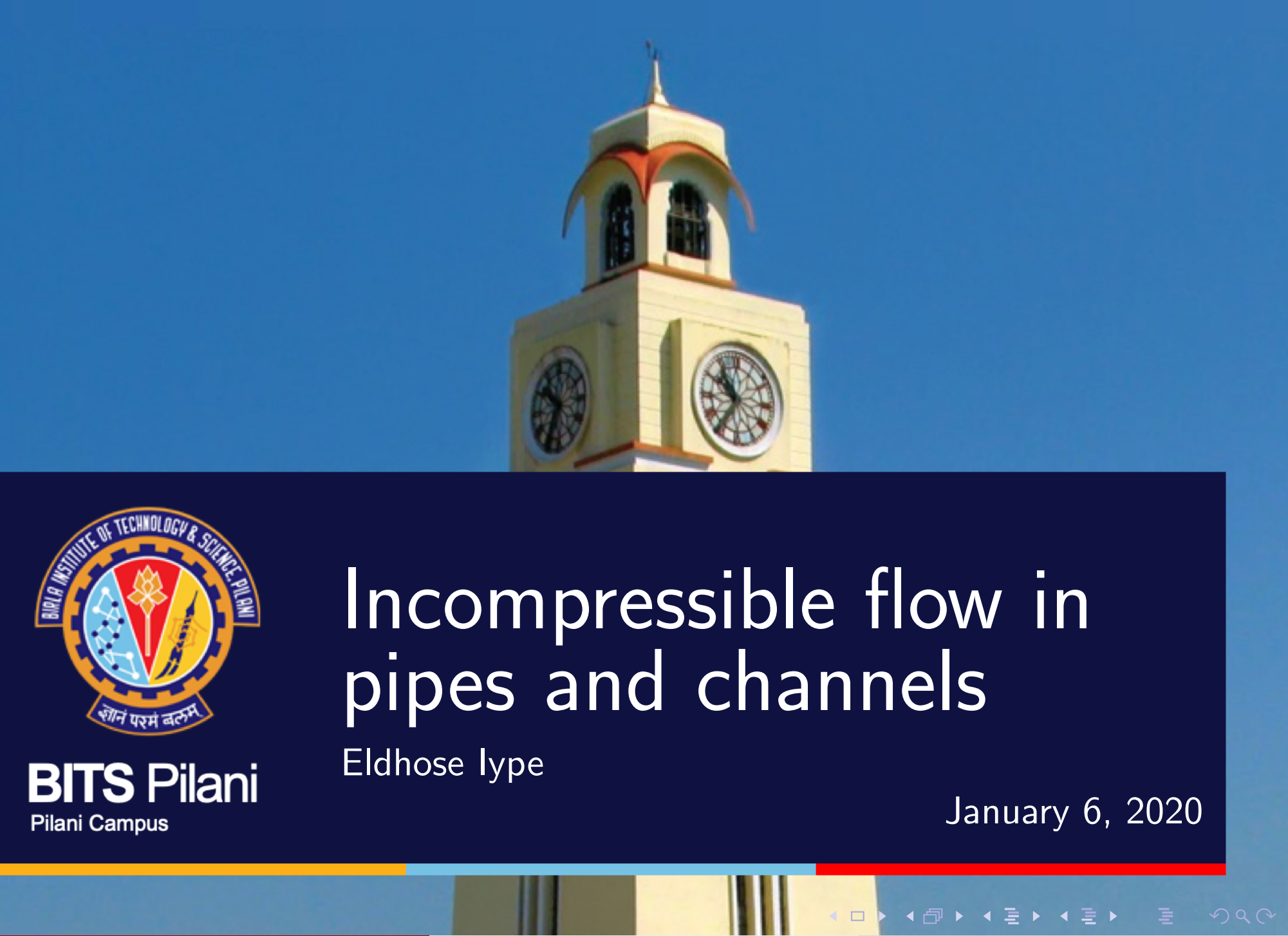


Incompressible flow in pipes and channels

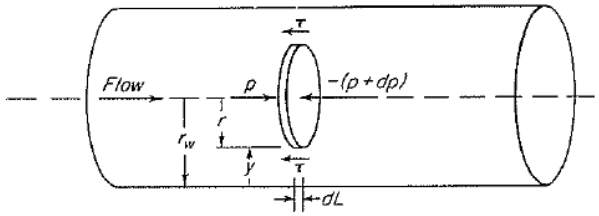
Eldhose Iype

BITS Pilani
Pilani Campus

January 6, 2020

Course Number: CHE F212
Title: Fluid Mechanics
Lecture No. 1

Shear-stress distribution



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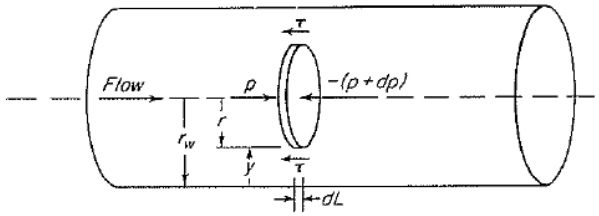
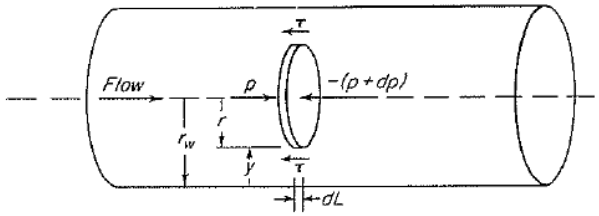


Applying momentum balance for the disc shaped fluid element

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

Shear-stress distribution



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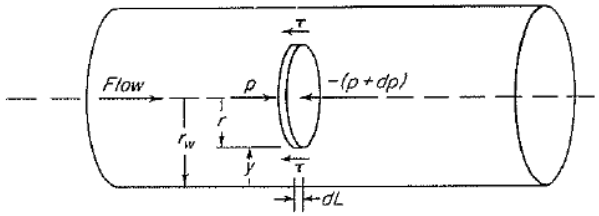
Shear-stress distribution



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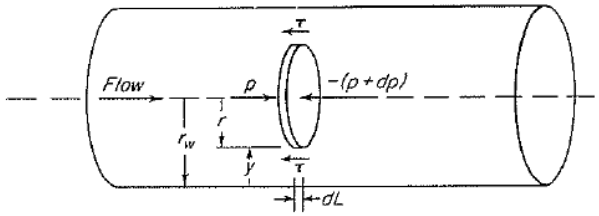
Shear-stress distribution



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Shear-stress distribution

Combining both equations, we get

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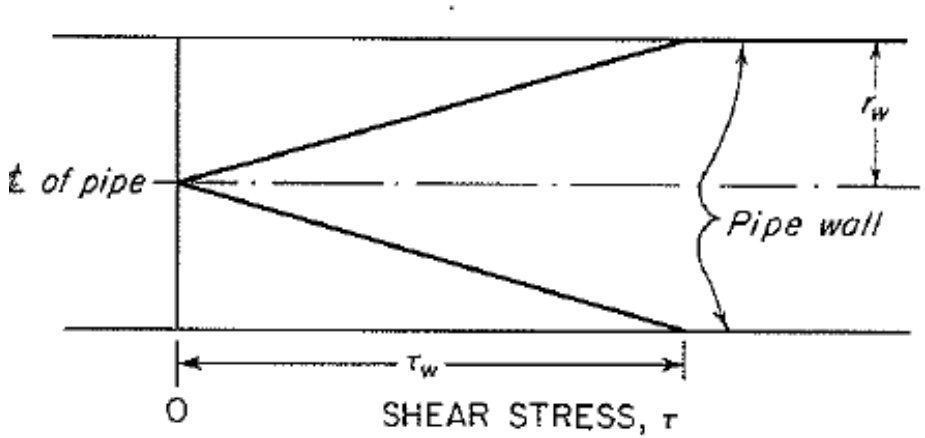

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