

Fan | Axial Area Blower fan

$$\rho_{air} = 1.152 \text{ kg/m}^3 \text{ (Cold air)}$$

$$V = 30 \text{ m/s}$$

After the sampler air = 4 kg/s Water-spray entered then accelerates to the same speed.

How much is the change of velocity for the water?  
How much is the  $\Delta P_{st}$  and  $\Delta P_{total}$  on the mixing space of  $A = 0.12 \text{ m}^2$ . How much are the  $\rho$

$$\rho_{air} = \frac{1}{2} \rho V^2 = \frac{1.152}{2} 30^2 = 594 \text{ Pa}$$

Impulse change only water

$$I = \dot{m} \cdot v = 4 \cdot 30 = 120 \text{ N} = A (P_a - P_0) = 0.12 \cdot 20$$

$$\Delta P = \frac{I}{A} = \frac{120}{0.12} = 600 \text{ Pa}$$

Pressures:

$$P_1 = P_0 - \rho_{air} v^2 = -594 \text{ Pa}$$

$$P_2 = 600 \text{ Pa}$$

$$\Delta P_{st} = P_2 + P_1 - P_0 = 600 + 594 + 0 = 1194 \text{ Pa}$$

Dynamic Pressure of the mixture

$$\rho_{mixture} = \frac{\rho_{air} v_{air}^2}{2} = \frac{A \rho_{air} v_{air}^2}{2} = \frac{4 + 0.12 \cdot 1.152 \cdot 30}{2 \cdot 0.12} = 894 \text{ Pa}$$

